



٤

College Reading

ENGLISH FOR ACADEMIC SUCCESS

القطع كاملة والاستراتيجيات والقواعد النحوية

مع الترجمة إلى العربية
Cheryl Benz
Georgia Perimeter College

Cynthia M. Schuemann
Miami Dade College

SERIES EDITORS

Patricia Byrd

Joy M. Reid

Cynthia M. Schuemann

هذا العمل هو نتاج مجهد فردي، لذلك فهو ليس للبيع ولا أسامح ولن أبيح من يقوم ببيعه، ولا أريد سوى دعوة صادقة في ظهر الغيب

المكتبة الشاملة لطلاب اللغة الإنجليزية - جامعة الملك عبد العزيز (<http://www.kaues.org>)



HEINLE
CENGAGE Learning®

Australia • Brazil • Japan • Korea • Mexico • Singapore • Spain • United Kingdom • United States

Reading Selection 1

TEXTBOOK RECONNAISSANCE

By Dave Ellis

- 1 **S**tart becoming a master student this moment. Do a 15-minute "textbook reconnaissance" of this book. Here's how:
 - 2 First, read the table of contents. Do it in three minutes or less. Next, look at every page in the book. Move quickly. Scan headlines. Look at pictures. Notice forms, charts and diagrams.
 - 3 A textbook reconnaissance shows you where a course is going. It gives you the big picture. That's useful because brains work best when going from the general to the specific. Getting the big picture before you start makes details easier to recall and understand later on.
 - 4 Your textbook reconnaissance will work even better if, as you scan, you look for ideas you can use. When you find one, write down the page number and a short description of it in the space below. The idea behind this technique is simple: It's easier to get excited about a course if you know it's going to be useful, interesting, or fun.
 - 5 When you have found the five interesting ideas, stop writing and continue your survey. Remember, look at every page, and do it quickly. And here's another useful tip for the master student: Do it now.

Source: Ellis, D. (2000). *Becoming a Master Student*. Boston: Houghton Mifflin, p. 1.

Chapter 2 : Reading and Learning

الاستطلاع المنهجي - صفحة ٥٣

ابدأ لتصبح طالب بارع هذه اللحظة. اعمل ١٥ دقيقة
استطلاع منهجي لهذا الكتاب .

أولاً: اقرأ جدول المحتويات، اعملها في ثلاثة دقائق أو أقل.

ثانية: انظر لكل صفحة في الكتاب تحرك بسرعة.
امسح العناوين الرئيسية . انظر إلى الصور . لاحظ التمآذج .
الأشكال ،، والمخططات .

الاستطلاع المنهجي يعرض لك أين يذهب الكورس، وهو يعطيك الصورة الكاملة. هذا مفيد لأن الأدمة تعمل بشكل أفضل عندما تذهب من العام إلى المخصص. الحصول على الصورة الكبيرة والكاملة قبل البداية يجعل التفاصيل أسهل للتذكر والفهم لاحقاً.

استطلاعك المنهجي سيعمل جيدا حتى لو كان، كما تمسح، انظر إلى الأفكار التي يمكنك استخدامها. إذا وجدت واحدة ، اكتب بالأسفل رقم الصفحة ووصف صغير لها في الفراغ بأسفل الورقة. الفكرة التي وراء هذه التقنية هي سهلة: إنها أسهل للحصول على الحماس للكورس إذا علمت أنها ستكون مفيدة، وممتعة، أو مرحة.

إذا وجدت الخمس أفكار الممتعة، أوقف الكتابة واستمر باستطلاعك. تذكر، انظر لكل صفحة، واعملها بشكل سريع. وهذا معلومات مفيدة للطالب البارع: افعلها الآن.

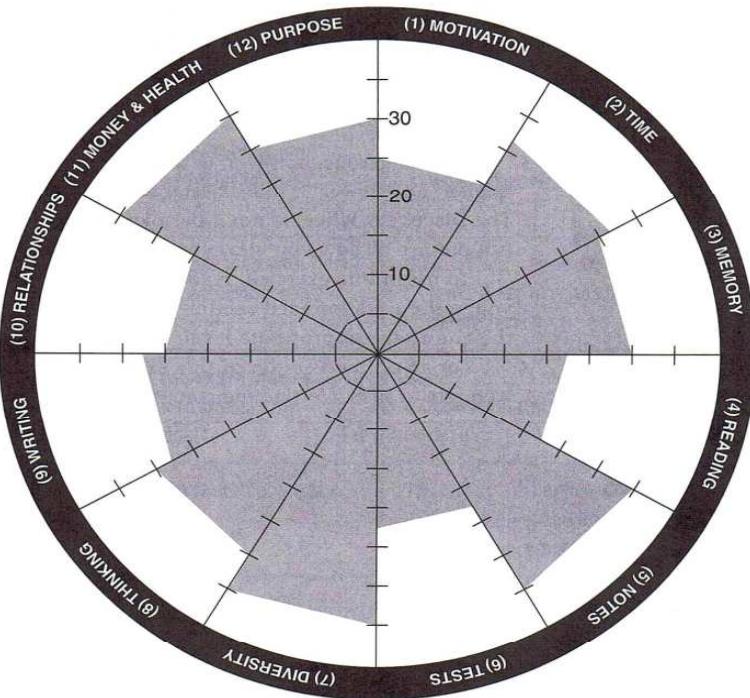
Reading the Selection

Read the selection and complete the survey. Carefully follow the directions for assigning points and calculating totals. As you read, keep in mind that words from the Academic Word List (AWL) in the reading selections have dotted underlines.

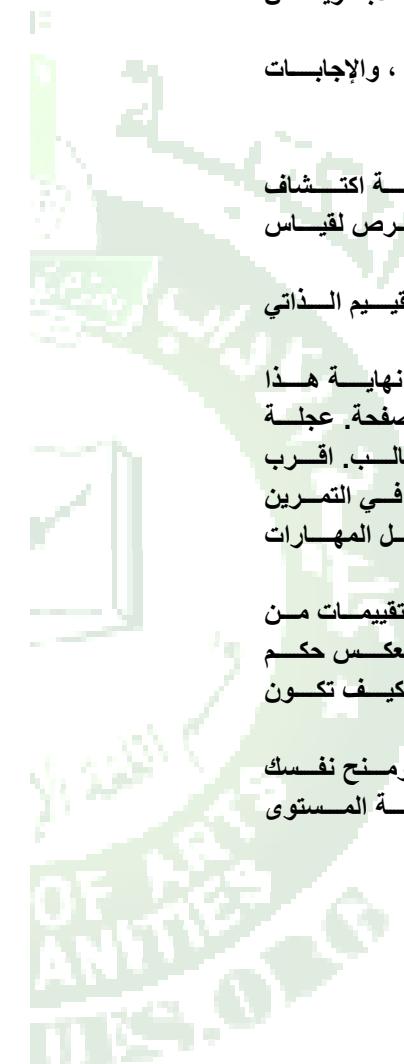
Reading Selection 2

THE DISCOVERY WHEEL

Sample Discovery Wheel



- 1 The Discovery Wheel is another opportunity to tell the truth to yourself about the kind of student you are and the kind of student you want to become.
- 2 This is not a test. There are no trick questions, and the answers will have meaning only for you.
- 3 Here are two suggestions to make this exercise more effective. First, think of it as a beginning of an opportunity to change. There is another Discovery Wheel at the end of this book. You will have a chance to measure your progress, so be honest about where you are now. Second, lighten up. A little laughter can make self-evaluations a lot more effective.
- 4 Here's how the Discovery Wheel works. By the end of this exercise, you will have filled in a circle similar to the one on this page. The Discovery Wheel circle is a picture of how you see yourself as a student. The closer the shading comes to the edge of the circle, the higher the evaluation. In the above example, the student has rated her reading skills as low and her note-taking skills as high.
- 5 It is dangerous, however, to think of these evaluations in terms of "higher" and "lower" if those designations reflect a negative judgment. The Discovery Wheel is not a permanent picture of who you are. It is a picture of how you view your abilities as a student today.
- 6 To begin this exercise, read the following statements and award yourself points for each section and shade the Discovery Wheel at the end to the appropriate level.
- 7 For an online version of this exercise, visit Heinle's World Wide Web site at <http://elt.heinle.com/collegereading>.



عجلة الاكتشاف - صفحة ٥٧

عجلة الكشف هي فرصة أخرى لإخبار الحقيقة لنفسك حول أي نوع من الطلاب أنت وأي نوع من الطلاب تريد أن تصبح.

هذا ليس امتحان. لا يوجد أسئلة خادعة ، والإجابات سيكون لها معنى فقط لك أنت.

هذا اقتراحين لجعل هذا التمرين أكثر فعالية.

أولا: اعتبره بداية فرصة للتغيير ، يوجد عجلة اكتشاف أخرى في نهاية هذا الكتاب. سيكون لديك فرص لقياس تقدمك، لذلك كن صادقاً عن أين أنت الآن.

ثانياً: خفف .. الضحك قليلاً يمكن أن يجعل التقييم الذاتي أكثر فعالية.

هذا كيف تعمل عجلة الاستكشاف. عند نهاية هذا التمرين، ستملاً دائرة مماثلة لما في هذه الصفحة. عجلة الاستكشاف هي صورة لماترى به نفسك كطالب. اقرب التضليل يأتي إلى حافة الدائرة، وارتفاع التقييم. في التمرين السابق ، الطالب يقدر مهارات قراءته كما اقل المهارات وتدوين الملاحظات كالأعلى.

إنه خطير على أي حال ، للتفكير في هذه التقييمات من حيث "الأعلى" "وال أقل" إذا هذه التسميات تعكس حكم سلبي . عجلة الاستكشاف ليست صورة دائمة لكيف تكون هي صورة لكيف تعرّض قدراتك كطالب اليوم .

للبداية بهذا التمرين ، اقرأ البيانات التالية ومنح نفسك نقاط لكل قسم وظلل عجلة الاستكشاف في نهاية المستوى الملام.



Reading the Selection

This time, we will not preview vocabulary. As you read, have two highlighters ready. Use one to mark important content (ideas to remember) and another to mark important words to remember and learn. Think about your content and word selection **process** as you mark.

Reading Selection 3

MUSCLE READING

How Muscle Reading Works

The key idea behind Muscle Reading is that your textbooks have something you want. They offer knowledge and valuable information. Sometimes the value is so buried that extracting it requires skill and energy. Muscle Reading is a three-phase technique you can use to accomplish that extraction. Each of the three phases has three steps. To assist your recall of the nine steps, memorize these short sentences: Pry out questions. Root up answers. Recite, review, and review again.



2 Take a moment to invent images for each of those sentences. First, visualize or feel yourself prying questions out of a text. These are questions you want answered based on your brief survey of the assignment. Make a mental picture of yourself scanning the territory, spotting a question, and reaching into the text to pry it out. Hear yourself saying, "I've got it. Here's my question."

3 Then root up the answers to your questions. Get your muscles involved. Flex. Feel the ends of your fingers digging into the text to root up the answers to your questions.

4 Finally, hear your voice reciting what you have learned. Hear yourself making a speech about the material. Hear yourself singing it.

5 These sentences are an acrostic. The first letter of each word stands for one Muscle Reading process. Thus:

Pry	Out	Questions.	Root	Up	Answers.
R	U	U	E	N	N
E	T	E	A	D	S
V	L	S	D	E	W
I	I	T		R	E
W	N	I		L	R
	E	O		I	
		N		N	E

Recite, Review, and Review again.

E	E	E
C	V	V
I	I	I
T	E	E
E	W	W

خذ لحظة لاحتراع الصور لكل هذه الجمل .

أولاً: كون صورة ذهنية أو حسّس نفسك انك تحدق بالأسئلة خارج النص . هذه الأسئلة التي تريدها محلولة وتعتمد على مسح القصیر للواجب . اعمل صورة عقلية لمسحك بنفسك للأرض (النص) ، اكتشف السؤال ، والوصول إلى النص بتمعن . اسمع نفسك تقول ((حصلت عليه)) هنا سؤالي .

من ثم استأصل الإجابات لسؤالك، اجعل عضلاتك تشاركك، أحسّس نهاية أصابعك تحفر النص لاقتناع الحالو لأسئلتك .

وأخيراً، اسمع صوتك يقول بصوت يقرأ ما تعلمه . اسمع نفسك تضع كلام عن المادة . اسمع نفسك تتفقّها .

هذه الجمل مطابقة لقراءتها أفقياً الحرف الأول لكل كلمة مستندة على واحدة من عملية القراءة العضلية .



6 Configured another way, the three phases and nine steps look like this:

الثلاث مراحل والتسع خطوات تبدو مثل هذه..

<i>Before you read:</i> Pry out questions.	قبل أن تقرأ: حدق إلى الأسنان.
Step 1: Preview	معاينة
Step 2: Outline	تحديد
Step 3: Question	سؤال
<i>While you read:</i> Root up answers.	بينما أنت تقرأ: اجترب الأجوبة.
Step 4: Read	قراءة
Step 5: Underline	تسطير
Step 6: Answer	إجابة
<i>After you read:</i> Recite, review, and review again.	بعد أن تقرأ:
Step 7: Recite	قراءة
Step 8: Review	مراجعة
Step 9: Review again	مراجعة مرة أخرى

7 A nine-step reading strategy might seem cumbersome and unnecessary for a two-page reading assignment. It is. Keep in mind that Muscle Reading is not an all-or-nothing package. Use it appropriately. You can choose what steps to apply as you read. The main point is to preview, read, and review. The nine steps are just strategies for accomplishing those tasks.

8 Muscle Reading takes a little time to learn. At first you might feel it's slowing you down. That's natural. Mastery comes with time and practice. If you're still concerned about time, give yourself some options.

9 For example, apply the techniques on the following pages to just one article or part of a chapter.



استراتيجية قراءة التسع خطوات تبدو متبعة وغير ضرورية لقراءة صفحتين من القطعة. هي كذلك تذكر أن القراءة العضلية ليست رزمة كل شيء أو لا شيء . استخدمها بشكل ملائم . يمكنك الاختيار لأي الخطوات ستطبقها كما قرأت. النقطة الرئيسية تكون للعرض ، القراءة ، والمراجعة. الخطوات التسع هي استراتيجيات فقط لإنجاز هذه الواجبات والأعمال (القراءة).

القراءة العضلية تأخذ وقت قليل لتعلمها . بداية أنت قد تشعر بأنها تبطئك . هذا طبيعي . التفوق يأتي مع الوقت والممارسة . إذا بقيت مهتم بالوقت ، أعط نفسك بعض الخيارات.

مثال ، طبق التقنيات على الصفحات التالية لمقالة واحدة أو جزء من فصل .

Before You Read: Pry Out Questions

Step 1: Preview

10 Before you begin, survey the entire assignment. You did a survey of this book for Exercise 1: "Textbook reconnaissance." Research indicates that this technique, called previewing, can significantly increase your comprehension of reading material.

11 If you are starting a new book, look over the table of contents and flip through the text page by page. Even if your assignment is merely a few pages in a book, you can benefit from a brief preview of the table of contents.

12 Keep the preview short. If the entire reading assignment will take less than an hour, your preview might take five minutes. Previewing is also a way to get yourself started when an assignment looks too big to handle. It is an easy way to step into the material.

13 When previewing, look for familiar concepts, facts, or ideas. These items can help link new information to previously learned material. Look for ideas that spark your imagination or curiosity. Ask yourself how the material can relate to your long-term goals. Inspect drawings, diagrams, charts, tables, graphs, and photographs.

14 Keep an eye out for summary statements. If the assignment is long or complex, read the summary first. Many textbooks have summaries in the introductions or at the end of each chapter.

15 Read all chapter headlines, section titles, and paragraph headlines. These are often brief summaries in themselves.

16 If you expect to use a book extensively, read the preface. The author often includes a personal perspective in a preface. A picture of the person behind the words can remove barriers to understanding. Look for lists of recommended articles. If you have difficulty with a concept, sometimes another viewpoint can help you nail it down.

17 Before you begin reading, take a few moments to reflect on what you already know about this subject, even if you think you know nothing. This technique prepares your brain to accept the information that follows.

18 Finally, determine your reading strategy. Skimming might be enough for some assignments. For others, all nine steps of Muscle Reading might be appropriate. Ask yourself these questions: How will I be tested on the material? How useful will this knowledge be later? How much time can I afford to spend on this assignment?

قبل أن تقرأ : حدق بالأسئلة
الخطوة الأولى : الاستعراض

قبل أن تبدأ ، امسح كامل الواجب . أنت عملت استطلاع لهذا الكتاب في تمرين 1 " الاستطلاع المنهجي " . البحث يشير إلى أن هذه التقنية تسمى الاستعراض . يمكن أن تساعد بشكل ملحوظ في زيادة فهمك لقراءة المادة .

إذا بدأت في كتاب جديد ، انظر إلى الفهرس ، وتصفح من خلال النص صفحة . صفحة . حتى لو كان هدفك مجرد استعراض الصفحات في الكتاب ، يمكنك الاستفادة من استعراض قصير لفهرس الكتاب . احرص أن يكون الاستعراض قصير . إذا كان كامل واجب القراءة سيأخذ أقل من ساعة واحدة ، استعراضك قد تأخذ خمس دقائق . والاستعراض أيضاً تكون طريق لاطماء نفسك البدائية عندما يبدو الواجب كبير جداً للمعالجة والتعامل معه . إنها طريق سهل لخطوة إلى المادة .

عندما ينضر الاستعراض لمفاهيم مألوفة ، وحقائق ، وأفكار . هذه المفردات يمكن أن تساعد فيربط المعلومات الجديدة للمادة المتعة سابقاً . انظر إلى الأفكار التي تشغل خيالك أو حب استطلاعك وفضولك . أسأل نفسك كيف يمكن أن تكون المادة لها علاقة بأهدافك طويلة المدى . فتش في الرسومات ، التخطيطات ، المخططات البيانية ، الجداول ، الرسومات والصور .

رافق خلاصة البيانات . إذا الواجب يكون طويلاً أو معقداً ، اقرأ الخلاصة أولاً . كثير من المناهج لديها خلاصات في المقدمة أو في نهاية كل فصل .

اقرأ كل العناوين الرئيسية للفصل ، وعناوين الأقسام ، والعناوين الرئيسية للبرقرافات . هذه بنفسها تكون خلاصات قصيرة . إذا توقعت استخدام الكتاب على نطاق واسع ، اقرأ المقدمة . يتضمن في المقدمة غالباً المنظور الشخصي للمؤلف . صورة الشخص خلف الكلمات التي يمكن أن تزيل المانع لفهم . انظر إلى قوائم المقالات الموصى بها . إذا كان لديك صعوبة مع المفهوم ، (أتأسف أخر كلمتين بهذه الجملة ما استوعبها ولم استطع ترجمتها) .

قبل أن تبدأ في القراءة . خذ لحظات قليلة لتنعكش على ماذا تعرفه بالفعل عن هذا الموضوع ، حتى لو تعتقد أنك لا تعرف شيء . هذه التقنية تجهز مخك لقبول المعلومات التي تليها .

وأخيراً . حدد إستراتيجية قراءتك . التصفح قد يكون كافي لبعض الواجبات . للآخريات . كل الخطوات التسع لقراءة العضلة قد تكون فرصة . أسأل نفسك هذه الأسئلة . كيف سأختبر هذه في هذه المادة ؟ كيف ستكون هذه المعرفة مفيدة في وقت لاحق ؟ كم الوقت الذي ساقضيه في هذه المهمة ؟

19 To clarify your reading strategy, you might write the first letters of the Muscle Reading acrostic in a margin or at the top of your notes and check off the steps you intend to follow. Or write the Muscle Reading steps on 3" x 5" cards and use them for bookmarks.

20 You don't have to memorize what you preview to get value from this step. Previewing sets the stage for incoming information by warming up a space in your mental storage area.

Step 2: Outline

21 The amount of time you spend on this step will vary. For some assignments (fiction and poetry for example), skip it. For other assignments, a 10-second mental outline is all you need.

22 With complex material, take time to understand the structure of what you are about to read. If your textbook provides chapter outlines, spend some time studying them.

23 If a text does not provide an outline, sketch a brief one in the margin of your book or at the beginning of your notes. Then, as you read take notes and fill in your outline.

24 Section titles and paragraph headlines can serve as major and minor topics for your outline. If assigned reading does not contain section titles or headlines, you can outline the material as you read. In this case, outlining actively organizes your thoughts about the assignment.

25 Use whatever outline style works best for you. Some readers prefer your traditional Roman numeral outlines. Others prefer mind maps or notes in the Cornell format. (These methods are explained in Chapter Five.) If your text includes headings in bold or italic print, you can also outline right in the text. Assign numbers or letters to each heading, just as you would for a traditional outline.

26 Outlining can make complex information easier to understand.

Step 3: Question

27 Ask yourself what you want from an assignment before you begin reading. Your preview might suggest some questions. Imagine the author is in the room with you. What would you ask him? How can he help you get what you want from your education? Create a dialogue. Begin your active participation in the book before you start to read.

لتوسيع إستراتيجية قراءتك . أنت قد تكتب الحروف الأولى لقراءة العضلة بترتيب في الهاشم ١ وفى أعلى ملاحظاتك واشر إلى الخطوات التي تتوى اتبعها، أو اكتب خطوات قراءة العضلة في كروت "٥ x ٣" واستخدمها مرجعيات .

ليس من الضروري حفظ ما تستعرض للحصول على القيمة من هذه الخطوات، استعراض المجموعات مرحلة للمعلومات القادمة لتسخين الفضاء لمنطقة التخزين العقلي لديك .

الخطوة الثانية : التخطيط أو التلخيص .

لحظة الوقت الذي تقضيه في هذه الخطوة . ستخلف . لبعض الواجبات والمهام (قصة وشعر - مثال) تخطها . للواجبات الأخرى ، عشر ثواني تخطيط عقلي تكون كل ما تحتاج . مع المواد الصعبة ، خذ الوقت الكافي لفهم التركيبة لماذا تقرأ عنه . إذا كان منهجك مزود بفصل تخطيط ، اقضي بعض الوقت لدراسته . إذا كان النص غير مزود بتخطيط خطوط واحدة قصيرة في هامش كتابك او في بداية ملاحظاتك . ثم كما قرأت ضع ملاحظاتك وإملانها في التخطيط .

عناوين القسم والغواصين الرئيسية للبرقraf يمكن أن تعلم كعنوان رئيسي وعنوان ثانوي لخطيطك . إذا القراءة التي خصصتها لا تحتوي على قسم عناوين أو عناوين رئيسية ، يمكن اختصار المادة كما قرأت . التخطيط بشكل نشيط ينظم أفكارك بكل ما يتعلق بالواجب .

استخدام نمط أو تقييم للملخص يعلم على نحو أفضل بالنسبة لك . يفضل بعض القراء خلاصتك الرقمية الرومانية التقليدية . والبعض يفضل الخرائط الذهنية أو الملاحظات في شكل صيغة ((كورنيل)) . ((هذه الطريق مشروحة في الفصل الخامس)) . إذا كان نصك يتضمن عناوين في جراءة أو الطباعة الإيكالية ، يمكن أيضا التلخيص في اليمين من النص . خصص أرقام وحروف لكل عنوان . كما تفعل للخلاصة أو التخطيط التقليدي .

التلخيص يمكن أن يجعل المعلومات الصعبة أسهل لفهم .

الخطوة الثالثة : السؤال

سؤال نفسك ماذا تريده من الواجب قبل البدء بالقراءة . استعراضك قد يقترح عليك بعض الأسئلة . تخيل المؤلف يكون في الغرفة معك ماذا كنت ستسأله كيف يمكنه مساعدتك للحصول على ما تريده من تعليمك ؟ أخلق حوارا . ابدأ مشاركتك النشطة في الكتاب قبل أن تبدأ في القراءة .

28 Write down a list of questions. Be tough. Demand your money's worth from your textbook. If you do not understand a concept, write specific questions about it. The more detailed your questions, the more powerful this technique becomes. Knowledge is born of questions.

29 If a reading assignment seems irrelevant, sit back for a minute and think about what it is you want from your time in school. Check to see if your education will be complete without this piece of the puzzle. Even if a particular assignment doesn't have personal meaning for you at the moment, it may be tied to a broader goal like getting a certain grade in class.

30 Another useful technique is to turn the chapter headings and section titles into questions. For example, if a subtitle is "Transference and Suggestion," you can ask yourself, What are transference and suggestion? How does transference relate to suggestion? Make up a quiz as if you were teaching this subject to your classmates.

31 Make the questions playful or creative. Have fun with this technique. You don't need to get an answer to every question you ask. The purpose of making up questions is to get your brain involved in the assignment. Take your unanswered questions to class, where they can be springboards for discussion.

32 Learning to ask effective questions takes practice, and you can discover rewards for developing this skill. The questions you formulate help you stay alert through complicated reading.

33 Boredom and fatigue tend to disappear when you're busy finding answers. In fact, when you find one, expect a burst of energy. It might be a small burst, if it was a small question. Or it might bring you right out of your chair if the question was important to you. If you find a series of answers in a reading assignment, you might finish the assignment feeling more energetic than when you began.

34 For some assignments, you might spend considerable time previewing, outlining, and asking questions before you start reading. The potential rewards are understanding and remembering more of what you read and saving time.

اكتب أسفل قائمة الأسئلة . ستكون قاسيا . اطلب قيمة مالك من المنهج . إذا كنت لم تفهم المفاهيم ، اكتب أسئلة محددة عنـة . الأسئلة الأكثر تفصيلا ، تصبح هذه التقنية أكثر قوـة المعرفة ولدت من الأسئلة ..

إذا كان واجب القراءة يبدو لا علاقـة له . استرجـع دقيقـة وفكـر عنـ ماذا أنت تـريد من الوقت في المدرـسة . تـأكـد أو افحـص لرؤـية إذا تعـليمـكـ سيكون مـكـتمـل بـدون هـذا الصـنـف من الأـنـفـارـ . حتى إذا الـوـاجـبـ المعـيـنـ لاـ يوجدـ فيـهـ معـنىـ شـخـصـيـ لـكـ فـيـ هـذـهـ الـلـحظـةـ ، قدـ تكونـ هـيـ مـرـبـوـطـةـ بـهـدـفـ أوـسـعـ مـثـلـ الـحـصـولـ عـلـىـ درـجـةـ معـيـنـةـ فـيـ الـفـصـلـ .

الـتـقـيـاتـ الـمـفـيـدـةـ الـأـخـرـىـ تـكـوـنـ لـتـحـوـيـلـ عـنـاوـينـ الـفـصـلـ وـعـنـاوـينـ الـقـسـمـ إـلـىـ أـسـئـلـةـ (ـمـثـالـ)ـ إـذـاـ العـنـوانـ الـثـانـيـ يـكـوـنـ اـنـتـقـالـ وـاقـتـرـاـحـ يـمـكـنـكـ سـؤـالـ نـفـسـكـ . ماـ هـوـ الـاـنـتـقـالـ وـالـاـقـتـرـاـحـ .. ماـ هـيـ عـلـاـقـةـ الـاـنـتـقـالـ بـالـاـقـتـرـاـحـ . اـعـمـلـ اـخـتـيـارـ كـمـاـ لوـ كـنـتـ تـدـرـسـ هـذـهـ الـمـوـضـوـعـ لـزـمـلـاـنـكـ .

اعـمـلـ أـسـئـلـةـ إـبـدـاعـيـةـ أوـ هـزـلـيـةـ . اـسـتـمـتـعـ مـعـ هـذـهـ الـتـقـيـةـ . أـنـتـ لاـ تـحـتـاجـ الـحـصـولـ عـلـىـ إـجـابـةـ لـكـلـ سـؤـالـ سـأـلـتـهـ . الـغـرـضـ مـنـ طـرـحـ الـأـسـئـلـةـ يـكـوـنـ لـإـعـطـاءـ مـخـكـ الـمـشـارـكـةـ فـيـ الـوـاجـبـ . اـتـرـكـ أـسـئـلـتـكـ التـيـ لـاـ جـوابـ لـهـاـ لـلـفـصـلـ ، حـيـثـ يـمـكـنـ أـنـ تـكـوـنـ مـنـطـقـ لـلـتـقـاشـ .

تـعـلـمـ لـمـارـسـةـ سـؤـالـ أـسـئـلـةـ فـعـالـةـ . يـمـكـنـكـ اـكـتـشـافـ الـمـرـدـوـدـاتـ الـمـفـيـدـةـ لـتـطـوـيـرـ هـذـهـ الـمـهـارـةـ . الـأـسـئـلـةـ التـيـ أـعـدـتـهـاـ تـسـاعـدـكـ لـلـبـقـاءـ يـقـظـ خـلـالـ الـقـرـاءـةـ الـمـعـدـدـةـ .

الـمـلـلـ وـالـتـعـبـ تـمـيـلـ إـلـىـ الـاـخـتـفـاءـ عـنـدـمـاـ تـكـوـنـ مـشـغـلـاـ لـإـجـابـاتـ . فـيـ الـحـقـيـقـةـ عـنـدـمـاـ تـجـدـ وـاحـدـاـ فـتـوـقـعـ اـنـجـارـاـ مـنـ الطـاقـةـ قـدـ يـكـوـنـ اـنـجـارـاـ بـسـيـطـاـ إـذـاـ كـانـ السـؤـالـ صـغـيرـاـ أوـ قـدـ يـكـوـنـ لـكـ الـحـقـ فـيـ الـنـهـوـضـ مـنـ مـقـدـدـكـ إـذـاـ كـانـ السـؤـالـ مـعـقـدـ بـالـنـسـبـةـ لـكـ . وـإـذـاـ وـجـدـتـ سـلـسلـةـ مـنـ إـجـابـاتـ مـنـ خـلـالـ قـرـاءـتـكـ لـلـمـهـارـةـ (ـالـوـاجـبـ)ـ رـيـماـ تـهـيـ الـوـاجـبـ بـشـعـورـ مـفـعـمـ بـالـحـيـوـيـةـ أـكـثـرـ مـنـ هـنـهـ بـدـأـتـ .

بعـضـ الـمـهـمـاتـ قـدـ تـبـذـلـ وـقـتـ فـيـهـاـ وـقـتـ أـكـبـرـ لـلـمـعـيـنـةـ التـاخـصـ وـطـرـحـ الـأـسـئـلـةـ قـبـلـ أـنـ تـبـدـأـ الـقـرـاءـةـ . وـالـثـمـارـ الـمـحـتمـلـةـ هـيـ فـهـمـ وـتـذـكـرـ أـكـبـرـ عـنـ مـاـ ذـيـ تـقـرـأـ وـكـذـلـكـ حـفـظـ الـوقـتـ .

While You Read: Root Up Answers

Step 4: Read

35 At last! You have previewed the assignment, organized it in your mind, and formulated questions. Now you are ready to begin reading.

36 As you read, be conscious of where you are and what you are doing. Practice Power process #2: "Be here now." When you notice your attention wandering, gently bring it back to the present.

37 One way to stay in the here and now is to make tick marks on scrap paper whenever you notice your attention flagging.

38 You might make many tick marks at first. That's OK. The marks signify your inattentiveness, so don't be too discouraged by lots of them. Most students notice that as they pay attention to their attention, the number of tick marks decreases. If a personal problem or some other concern is interfering with your concentration, experiment with this idea. Write down the problem along with a commitment to a future course of action. Getting a problem down on paper, with a commitment to take action, can free your mind for the present task.

39 Another way to stay focused is to hold marathon reading sessions. Schedule breaks and set a reasonable goal for the entire session. Then reward yourself with an enjoyable activity for five or ten minutes every hour or two. With practice, some students find they can stay focused up to three hours without a break.

40 For difficult reading, set shorter goals. Read for a half-hour, then break. Most students find that shorter periods of reading distributed throughout the day and week can be more effective than long sessions.

41 You can use the following three technique to stay focused as you read. First, visualize the material. Form mental pictures of the concepts as they are presented. If you read that a voucher system can help control cash disbursements, picture a voucher handing out dollar bills.

42 Second, read it out loud—especially complicated material. Some of us remember better and understand more quickly when we hear an idea.

43 Third, get a "feel" for the subject. For example, let's say you are reading about a microorganism, a paramecium, in your biology text. Imagine what it would feel like to run your finger around the long, cigar-shaped body of the organism. Imagine feeling the large fold of its gullet on one side, and feel the hairy little cilia as they wiggle in your hand.

عندما تقرأ : اقتلن الإجابات .
الخطوة الرابعة : أقرأ

أخيرا ، عاينت المهمة ، ونظمتها في عقلك ، وصفت الأسئلة ، الآن أنت مستعد للقراءة ، كن واعياً أين أنت وما الذي تفعله ، مارس عملية السلطة (كن هنا الآن) وعندما تشد انتباحك تجول بطف واعدها إلى الحاضر . طريقة واحدة للبقاء هنا والآن (أي متنبه) هي وضع علامات تجزئة على ورقة مهمة عندما يكون انتباحك متشتت . قد تصنع الكثير من علامات التجزئة في البداية ، لا بأس ، العلامات دلالة على غلتك لا تكن محبطاً كثيراً بسبب كثرتها . معظم الطلاب لا يحظوا أنها تلفت الانتباهم ، عدد علامات التجزئة ستنتقص . إذا كان هناك مشكلة شخصية أو أي قلق آخر يتخل في تركيزك جرب هذه الفكرة . أكتب المشكلة مع الالتزام بحلها في المستقبل . وضع المشكلة على الورقة مع الالتزام باتخاذ الإجراء ، تستطيع تحرير عقلك من المهمة الآن .

طريقة أخرى لتبقى مركزاً ، عقد جلسة قراءة ماراثونية ، اعمل جدول استراحات وتحديد هدف معقول للجلسة بأكملها ، وكافى نفسك بنشاط ممتع لمدة خمسة إلى عشرة دقائق كل ساعة أو ساعتين . مع التطبيق معظم الطلاب وجدوا أنفسهم بأنهم يبقون مركزين لثلاث ساعات بدون استراحة .

للقراءة الصعبة ، اجعل الأهداف أقصر ، أقرأ لنصف ساعة ثم توقف ، معظم الطلاب وجدوا أن فترات قصيرة للقراءة موزعة طوال اليوم أو الأسبوع تكون أكثر فعالية من الجلسات الطويلة .

يمكنك أن تستخدم التقنية الثلاثية التالية لتبقى مركزاً خلال القراءة .

أولاً : تصور المادة . من الصور الذهنية للمفاهيم كما قدمت . إذا كنت تقرأ نظام القسام يمكن أن تساعد في التحكم في المدفوعات النقدية ، صورة القسمة هي تسليم سندات الدولار .

ثانياً : أقرأها بصوت عال ، وخاصة المواد المعقدة ، بعضنا يتذكر أفضل ويفهم بسرعة أكبر إذا سمعنا الفكرة .

ثالثاً : اشعر بالموضوع ، على سبيل المثال : دعنا نقول بأنك تقرأ عن بكتيريا البراميسيوم في كتاب الأحياء ، تخيل ما الذي تشعر به إذا حرقت إصبعك فترة على شكل سيجار طوبل من الكائن الحي ، تخيل شعور طيبة كبيرة من المريء على جانب واحد وحاول أن تشعر بأهداب الشعر كالتي موجودة على يدك .

44 A final note: It's easy to fool yourself about reading. Just having an open book in your hand and moving your eyes across a page doesn't mean you are reading effectively. Reading textbooks takes energy, even if you do it sitting down. One study revealed that corporation presidents usually wear out the front of their chairs first. Approach your reading assignment like the company president. Sit up. Keep your spine straight. Use the edge of your chair. And avoid reading in bed, except for fun.

Step 5: Underline

45 Deface your books. Use them up. Have fun writing and coloring in them. Indulge yourself as you never could with your grade-school texts. Keeping textbooks clean and neat might not help you get what you want from them.

46 The purpose of making marks in a text is to create signals for reviewing. Underlining or highlighting can save lots of time when you study for tests.

47 A secondary benefit of marking is that when you read with a pen in your hand, you are involving another mode of perception, your kinesthetic sense—that is, your sense of touch and motion. Being physical with your books can help build strong neural pathways in your memory.

48 Avoid underlining or highlighting too soon. Wait until you've completed a section or concept to make sure you know what is important. Then mark up the text. Sometimes, stopping after each paragraph works best. For some assignments, you might want to read a larger section before deciding what to mark.

49 Some people prefer colored highlighters to pens for marking up a text. Pens can make underlined sections—in other words, the important parts—harder to read than the rest of book. You can still use a pen for making notes in the margins and circling important sections.

50 Underline or highlight sparingly, usually less than 10 percent of the text. If you mark up too much on a page, you defeat the purpose, which is to flag the most important material for review. Write in the margins of your texts. Write summary statements and questions. Mark passages that you don't understand. If you find a list or series of elements in a paragraph, you can circle and number them.

51 It's true that marking your textbooks can lower their resale value. The money you lose by doing it is ridiculously small compared to the value of your education. Writing in your textbooks helps you wring every ounce of value out of them.

النقطة الأخيرة : من السهل خداع نفسك عن القراءة . بمجرد فتح الكتاب في يدك وتحريك عينك عبر الصفحات لا يعني أنك تقرأ فعلا ، قراءة الكتاب المدرسي يأخذ طاقة . حتى لو قرأته جالسا ، دراسة كشفت أن رؤساء هذه الشركة يلبسون أمام كراسיהם ، أجعل نهج قرائتك للمهمة مثل رئيس الشركة ، أجعل عمودك الفقري مستقرا واستخدم حافة الكرسي ، تجنب القراءة في السرير إلا للملوءة .

الخطوة الخامسة : رسم الخطوط

شوه كتابك ، استخدمها ، املك متعة الكتابة والتلوين فيها ، اشبع نفسك كما لو أنك لست مع كتب المدرسيّة . المحافظة على الكتب نظيفة وأنيقة قد لا تساعدك على الحصول على ما تريده منها ،

الهدف من وضع العلامات في الكتاب هو وضع إشارات المراجعة ، رسم الخطوط أو تسلیط الضوء قد يحفظ الكثير من الوقت عندما تدرس للختبارات .

المصلحة الثانية من وضع العلامات هو انه عندما تقرأ بقلم في يدك تتطوّي على وضع آخر من إدراك إحساسك الحركي . هذا هو ، إحساسك في اللمس والحركة . أن الحركة الفيزيائية مع كتابك يساعد على بناء مسار عصبي في ذاكرتك . تجنب التحديد أو تسلیط الضوء بشكل سريع جدا . انتظر حتى تتمل المقطع أو المعنى حتى تكون متأكدا من الشيء المهم ، وبعد ذلك حدد في الكتاب ، بعض الأحيان التوقف بعد كل فقرة يؤدي لعمل أفضل ، بعض المهام قد تريده أن تقرأ المقطع الأكبر قبل أن تقرر ما الذي تحدده .

بعض الناس يفضل التلوين بقلم التحديد . الأقلام تقوم بتحديد المقطاع ، بتعبير آخر (الأجزاء المهمة) صعب القراءة أكثر من بقية الكتاب ، تستطيع أن تستمر في استخدام القلم لتلوين الملاحظات في الهوامش وعمل دوائر للمقطاع المهمة .

حدد أو أبرز باعتدال . عادة أقل من 10 % من الكتاب، إذا حددت كمية كبيرة في الصفحة فإنك تفشل في ما هي المادة الأكثر أهمية للمراجعة ، اكتب في الهوامش في كتابك ، اكتب عبارات مختصرة وأسئلة ، حدد الفقرة التي لم تفهمها ، إذا وجدت قائمة أو سلسلة من العناصر في الفقرة تستطيع عمل دوائر عليها أو ترقيتها .

صحيح أن هذا التحديد في كتابك يمكن أن يقلل من قيمته عند إعادة بيعه ولكن المال الذي فقدته بالتحديد سخيف مقارنة بالقيمة من تعلمك ، الكتابة في كتابك تساعدك في انتزاع كل أوقية (هلة) من قيمته .

Step 6: Answer

52 As you read, get answers to your questions and write them down. Fill in your outline. Write down new questions and note when you don't get the answers you wanted to find. Use these notes to ask questions in class, or see your instructor personally.

53 When you read, create an image of yourself as a person in search of the answers. You are a detective, watching for every clue, sitting erect in your straight-back chair, demanding that your textbook give you what you want—the answers.

After You Read: Recite, Review, & Review (Again)**Step 7: Recite**

54 Talk to yourself about what you have read. Or talk to someone else. When you finish reading an assignment, make a speech about it. One classic study suggests that you can profitably devote up to 80 percent of your study time to active reciting.¹

55 One way to get yourself to recite is to look at each underlined point. Note what you marked, then put the book down and start talking out loud. Explain as much as you can about that particular point. To make this technique more effective, do it in front of a mirror. It may seem silly, but the benefits can be enormous. You can reap them at exam time.

56 Friends are even better than mirrors. Form a group and practice teaching each other what you have read. One of the best ways to learn time is to teach it to someone else.

57 There is a secret buried in this suggestion. That secret is, have someone else do the work. Your instructors might not appreciate this suggestion, but it can be a salvation when you're pressed for time. Find a friend you trust and split up the reading assignment. Each of you can teach half the assignment to the other. (Warning: You might be far better versed in the part you read and teach. And if your friend misses an important part, you could miss it too.) Talk about your reading whenever you can.

Step 8: Review

58 Plan to do your first complete review within 24 hours of reading the material. Sound the trumpets, this is critical: A review within 24 hours moves information from your short-term memory to your long-term memory. It can save you hours later on. Review within one day. If you read it on Wednesday, review it on Thursday.

1. Gates, G. S. (1917). Recitation as a factor in memorizing. *Archives of Psychology*, 40.

الخطوة السادسة : أجب

وأنت تقرأ ، احصل على إجابات لأسئلتك واتكتبها في ملخصك (خطوطك العريضة) ، اكتب أسئلة جديدة ، دون التي لم تجد لها إجابة ، استخدم هذه المدونات (الملاحظات) لطرح أسئلة في الفصل ، أو أسأل معلمك شخصيا . عندما تقرأ أخلق صورة لنفسك كشخص يبحث عن إجابات وانك محقق ، مشاهدة كل فقرة ، الجلوس منتصب الظهر مستقيما على الكرسي ، اطلب من كتابك بان يعطيك كل ما تريده

بعد القراءة : أتل ، راجع ، راجع مرة أخرى**الخطوة السابعة : أتل**

تحدد مع نفسك عن ما الذي تقرأ ، أو تحدث مع أي شخص آخر ، بعد أن تكمل قراءة الواجب اعمل خطابا عنها ، إحدى الدراسات الكلاسيكية أشارت إلى انه يمكن أن تتمر في تكريس ٨٠٪ من وقت دراستك لقراءة نشطة .

طريقة واحدة لتجد نفسك تتلو وهي في النظر لكل نقطة محددة ، دون ما الذي حددته ويعذر ذلك ضع الكتاب جانبا وأبدأ التحدث بصوت عالي ، اشرح بقدر ما تستطيع عن تلك النقطة الخاصة ، لتطبيق هذه التقنية بشكل فعال افعليها مقابل المرأة ، قد تبدو سخيفة ولكن فوائدتها هائلة ، و تستطيع أن تحصدتها في وقت الاختبار .

الأصدقاء أفضل من المرايا ، شكل مجموعة وتمرنوا وكل واحد يدرس الآخر ماذا قرأ وأفضل الطرق لمعرفة الوقت هي تدريسه لشخص آخر . هناك سر مدفون في هذا الاقتراح ، هذا السر هو مع شخص يقوم بنفس العمل ، معلميك قد لا يقدرون هذا الاقتراح ، ولكنه يمكن أن يكون الإنقاذ في حال ضغط الوقت .

اعثر على صديق تستطيع أن تثق به واقسموا مهمة القراءة ، وكل واحد يدرس الآخر نفس المهمة (تحذير : قد تكون أكثر تucken في الجزء الذي قرأته وقد يكون صديقك اخطأ في جزء مهمته حتما ستقع أنت في الخطأ ذلك) ، تحدث عن قراءتك حينما تستطيع .

الخطوة الثامنة : راجع

ارسم خطة لإكمال مراجعتك الأولى في غضون ٢٤ ساعة من قراءة المادة ، صوت الأبواق هذا حاسم . مراجعة في غضون ٢٤ ساعة ينقل المعلومات من ذاكرتك قصيرة الأمد إلى ذاكرتك طويلة الأمد ، أنها تستطيع أن تحفظ لك ساعات في وقت لاحق .

المراجعة في يوم واحد ، إذا قرأت يوم الأربعاء راجع يوم الخميس .

59 During the review, look over your notes and clear up anything you don't understand. Recite some of the main points again.

60 At first, you might be discouraged by how much you think you forgot from the previous day. Don't worry. Notice how quickly you pick up the material the second time. One of the characteristics of memory is that even when you cannot recall something immediately, you can relearn it more easily if you have already learned it once. And relearning wears a deeper path into your memory.

61 This review can be short. You might spend as little as 15 minutes reviewing a difficult two-hour reading assignment. Investing that time now can save you hours later when studying for exams. Also remember that you can stop to review and check your comprehension at any point, even before you complete a whole reading assignment.

Step 9: Review Again

62 The final step in Muscle Reading is the weekly or monthly review. This step can be very short—perhaps only four or five minutes per assignment. Simply go over your notes. Read the highlighted parts of your text. Recite one or two of the more complicated points.

63 The purpose of these reviews is to keep the neural pathways to the information open and to make them more distinct. That way, the information can be easier to recall. You can accomplish these short reviews anytime, anywhere, if you are prepared.

64 Conduct a five-minute review while you are waiting for a bus, for your socks to dry, or for the water to boil. Three-by-five cards are a handy review tool. Write ideas, formulas, concepts, and facts on cards and carry them with you. These short review periods can be effortless and fun.

65 Sometimes longer review periods are appropriate. For example, if you found an assignment difficult, consider rereading it. Start over, as if you had never seen the material. Sometimes a second reading will provide you with surprising insights. Your previous experience acts as a platform from which you can see aspects that didn't appear during the first reading.

66 Schedule some review periods well in advance. You might set aside one hour on a Saturday or a Sunday to review several subjects. Keep your reviews short and do them frequently.

67 Finally, take some time to reflect on what you read. As you walk to and from class, in your discussions with other students, or before you go to bed at night, turn over new ideas in your mind. Take time to play with them. Develop a habit of regular review.

خلال المراجعة، انظر لكل ملاحظاتك ووضح أي شيء لم تفهمه. اتل بعض النقاط المهمة مرة أخرى.

أولاً : قد تكون محبطاً بسبب أنك ما تعتقد أنك نسيته من اليوم الماضي ، لا تقلق ، لاحظ كيف تلتفت بسرعة الموارد في المرة الثانية، واحدة من صفات الذاكرة حتى عندما لا تستطيع تذكر شيء ما حالياً ، تستطيع إعادة ما تعلمها بسهولة إذا كنت بالفعل تعلمتها مرة أخرى ، وإعادة التعلم يحدد مسار عميق في ذاكرتك.

هذه المراجعة تستطيع أن تكون قصيرة ، قد تبذل أقل من 15 دقيقة لمراجعة قراءة صعبة لمدة ساعتين ، استثمر هذا الوقت الآن لحفظ ساعاتك لاحقاً عندما تدرس للختبارات ، وكذلك تذكر أنك تستطيع أن تتوقف لمراجعة وتقييم فهمك في أي نقطة حتى قبل أن تكمل كل الواجب .

الخطوة التاسعة : راجع مرة أخرى

آخر خطوة في عملية القراءة هي مراجعة أسبوعية أو شهرية . هذه الخطوة يمكن أن تكون قصيرة جداً وربما فقط أربع أو خمس دقائق لكل واجب

بساطة عبر قراءة الملاحظات ، اقرأ هذه الأجزاء المحددة في كتابك واتل واحدة أو اثنتين من النقاط الأكثر تفصيلاً .

الغرض من هذه المراجعات لحفظ على المسارات العصبية للمعلومات مفتوحة ولتكون أكثر تميزاً ، بهذه الطريقة المعلومات ستكون سهلة للتذكر . يمكنك إنجاز هذه المراجعات القصيرة في أي وقت وفي أي مكان إذا كنت جاهزاً .

ادارة خمس دقائق للمراجعة بينما أنت تنتظر الباص ، لتجف جواربك ، لتغلي الماء ، ثلاث إلى خمس بطاقات تكون أداة مراجعة يدوية ، اكتب أفكار ، صيغ ، مفاهيم ، حقائق على بطاقات واحملها معك ، هذه فترات مراجعة تكون غير مجده ومتعدة .

بعض الأوقات فترات المراجعة الطويلة تكون مناسبة على سبيل المثال / عندما تجد المهمة صعبة اعد قرأتها. ابدأ من جديد وكأنك لم ترها من قبل ، بعض الأوقات القراءة الثانية تقدم لك إشارات مفاجئة لأن تجربتك السابقة كانتها منصة وتشاهد من خلالها جوانب لم تظهر لك خلال القراءة الأولى.

جدول فترات المراجعة في وقت مبكر قد تجلس ساعة في السبت أو الأحد لمراجعة مواد عديدة ، حافظ على مراجعتك قصيرة ومتكررة .

أخيراً : خذ بعض الوقت لتعكس ما تقرأ ، عندما تمشي من والي الفصل ، في نقاشاتك مع الطلاب ، أو قبل أن تذهب للنوم في المساء ، قلب أفكار جديدة في عقلك ، خذ وقت للعب معها ، طور عادة للمراجعة المنتظمة .

68 Psychologists speak of the primacy-recency effect,² which suggests that we most easily remember the first and last items in a presentation. Previewing and reviewing your reading is a powerful way to put this theory to work for you.

Source: Ellis, D. (2000). *Becoming a Master Student*. Boston: Houghton Mifflin, pp. 108-115.

علماء النفس يتحدثون عن تأثير الأولوية الحديثة، مما يوحي بأن علينا أن نذكر بسهولة العناصر الأولى والأخيرة في العرض. معاينة ومراجعة القراءة الخاصة بك هي وسيلة قوية لوضع هذه النظرية للعمل لديك.



الأفعال المستخدمة لإعادة الصياغة

١- يسمى فعل الذي يعرض إعادة الصياغة بفعل التقرير. يمكن أن يكون فعل التقرير في المضارع أو الماضي. استخدام المضارع يجعل الأفكار تبدو كأنها قريبة أو مباشرة وذات صلة بالوضع الحالي. استخدام الفعل الماضي يجعل الأفكار تشعر بأنها أقل فورية، ويمكن أن تؤثر أيضاً على التوتر من الفعل الثاني. قارن بين هذه الثلاثة:

إنه يشير إلى أن الحديث عن ما تقرأ يمكن أن يحسن فهمك.

أشار إلى أن الحديث عن ما تقرأ يمكن أن يحسن فهمك.

أشار إلى أن الحديث عن ما كنت قد قرأت أنه حسن فهمك.

٢- العديد من الأفعال التقريرية تُتبع بذلك. لاحظ أن استخدام هذا يتطلب بناء "verb + Subject" للإشارة. في كثير من الأحيان، هو صيغة الفعل، الأفعال التي في مربع التعبير أعلاه ينبغي إتباعها من قبل إنشاء "verb + subject + that"؟

Verbs for Paraphrasing

1. The verb that presents a paraphrase is called a reporting verb. The reporting verb can be in the present or past tense. Using present tense makes the ideas feel close or immediately relevant to a current situation. Using past tense makes the ideas feel less immediate and can also affect the tense of the second verb. Compare these three:

He indicates that talking about what you have read can improve your comprehension.

He indicated that talking about what you have read can improve your comprehension.

He indicated that talking about what you had read could improve your comprehension.

2. Many reporting verbs are followed by *that*. Notice that the use of *that* requires a "subject + verb" structure to follow. Often, the subject is a gerund phrase. Which verbs in the expressions box above need to be followed by a "that + subject + verb" structure?



Reading Selection 1

CHAPTER 1: "INTRODUCING PSYCHOLOGY"

Muscle
Reading
Reminder

Phase Two:
Read
Underline
Answer

¹ On the afternoon of July 24, 1998, the United States Capitol Building was already crowded with tourists as new arrivals lined up to go through a security check point at the public entrance. Russell Eugene Weston, Jr. was in line too, but he wasn't there to tour the building. Because he knew that the metal detector at the check point would be set off by the .38 caliber pistol he carried, he tried to walk around it. When the Capitol police officer Jacob Chestnut attempted to stop him, Weston drew his weapon and shot the officer in the head, killing him. Though hit by bullets fired by other police officers, Weston managed to run down a hallway and burst into the offices of Congressman Tom Delay, where another Capitol guard, special agent John Gibson, rose to challenge him. After an exchange of gunfire, Gibson, too, lay dead and Weston was gravely wounded. As investigators tried to find out what prompted Weston's deadly attack, it emerged that he had been diagnosed in 1996 as a paranoid schizophrenic¹ and placed in a mental hospital. This was after years of odd behavior, which included Weston's claims that both the Kennedy family and President Clinton were his close friends and that he was being spied on² by the government through his neighbors' TV satellite dishes. Weston was later released from the hospital because his doctors believed he was not a threat to himself or others if he took his prescribed antipsychotic medication.

² How could the hospital staff's judgment and decisions about Weston have been so wrong? Do all mental patients pose a similar threat to society? If not, how can we tell which of them are dangerous and which are not? Are mental disorders such as

1. **paranoia** (pär'ə-noï'ə) *n.* A psychotic disorder characterized by delusions of persecution or grandeur. **paranoiac** (-noï'ak', -noï'ik) *n.* —**paranoid** *adj. & n.*
schizophrenia (skīzō-fre'ne-ə, -frē'nē-ə) *n.* A severe mental disorder in which a person loses touch with reality and withdraws from other people. **-schizophrenic** (-frē'nīk) *adj. & n.*
2. **spy** (spī) *v.* To observe secretly with hostile intent; To investigate intensively.

Chapter 3 : Studying Memory

مقدمة في علم النفس

بعد ظهر يوم ٢٤ يوليو عام ١٩٩٨ كان مبني البرلمان الأمريكي مزدحماً بالسياح والقادمين الجدد ليمرروا عبر حاجز أمني عند مدخل الجمهور. براسيل يوجين وستون كان في الخط كذلك ولكنه لم يكن هناك لليقابن بحولة في المبني لأنّه علم بان في الحاجز الأمني جهاز كاشف للمعادن وسيوقفه لحمله مسدس عيار .٣٨ فحاول الدوران على الجهاز وعندما حاول ضابط شرطة البرلمان بعقوب كستن إيقافه وجه وستون إسلام عليه وأطلق على الضابط في رأسه فقتله . على الرغم من إطلاق النار من ضابط آخر تمكّن وستون من الجري في الرواق واقتصر مكاتب عضو الكونغرس تود ديلاي ، في حين حارس البرلمان (جون جيبسون) ارتفع ليتحداه وبعد تبادل لإطلاق النار مات (جيبسون) وأصيب (وستون) بجراح خطيرة .

حاول المحققون معرفة ما الذي دفع (وستون) للهجوم القاتل ، فاتضح انه شخص في عام ١٩٩٦ على انه منفصم شخصياً ووضع في مستشفى الامراض العقلية .

هذا كان بعد سنوات من السلوك الغريب ، وشملت مطالبات (وستون) كلّ من عائلة كنيدي والرئيس كلينتون من أصدقاء المقربين بأنه قد تجسس عليه من قبل الحكومة عبر ستالايتات جيرانه .

وكان قد أطلق سراح (وستون) من المستشفى لأن طبيبه اعتقد بأنّ لن يهدّد نفسه والآخرين إذا استخدم دواء (مضاد الذهان) .

كيف يمكن لموظفي المستشفى وقراراتهم عن (وستون) وقد تم ذلك بالخطأ؟ هل كل المرضى العقلين يشكلون خطراً على المجتمع؟ إذا كان لا ، كيف نستطيع القول أي منهم خطرين وأيهم لا؟ هل الاضطرابات العقلية مثل

schizophrenia caused by faulty genes,³ imbalances in brain chemicals, bad childhood experiences, or all of these factors? Can people like Weston be cured by drugs or psychotherapy? Will those who witnessed Weston's murderous attack be able to accurately recall what they saw and provide useful testimony at a trial? How will the witnesses' own lives be affected? Will they ever recover from their traumatic experience? Finally, why do newspaper and television accounts of this and other similar incidents so strongly affect millions of people who are thousands of miles away from the scene of the tragedy?

³ Psychologists study questions like these because **psychology** is the science that seeks to understand behavior and mental processes, and to apply that understanding in the service of human welfare. They have not yet provided final answers; but as you will see in later chapters, psychologists' research in areas such as judgment and decision-making, psychological disorders, memory, stress and coping, and social cognition has yielded important clues and valuable theories about why people think, feel, and behave as they do. That research tells part of the story of psychology, but there is much more. We wrote this book to give you a better understanding of what psychology is, what psychologists study, where and how they work, what they have—and have not—discovered so far, and how their discoveries are being put to practical use. In this chapter we present an overview of psychology as it exists today, and as it developed. Then we describe the unity and diversity of contemporary psychology, including the differing approaches to understanding psychological phenomena, and the many sub fields in which psychologists work.

Source: Bernstein, D. A., Clark-Stewart, A., Penner, L. A., Roy, E. J., & Wickens, C. D. (2000). *Psychology* (5th ed.)(p. 3) Boston: Houghton Mifflin Company.

3. **gene** (jēn) *n.* A segment of DNA, located at a particular point on a chromosome, that determines hereditary characteristics.

انفصام الشخصية حدثت بخلل جيني، اختلالات العقل الكيميائية، تجارب طفولة سينية أم كل هذه العوامل؟ هل الناس مثل (وستون) يمكن معالجتهم بالعقاقير أم بالعلاج النفسي؟ هل من شهد هجمة (وستون) القاتلة يكون قادر على تذكرها بدقة وتقديم شهادة مفيدة في المحاكمة؟ كف ستتأثر حياة الشهود الخاصة؟ هل يمكنهم التعافي من تجاربهم الصادمة؟ أخيراً : لماذا حسبت الصحف والتلفاز لهذه الحادثة والحوادث الأخرى بانها تؤثر بشدة في الملايين من الناس الذين يبعدون آلاف الأميال من المشهد المأساوي؟

علماء النفس يدرسون أسئللة مثل هذه لأن علم النفس هو العلم الذي يسعى لفهم السلوك والعمليات العقلية وتطبيق ذلك الفهم في خدمة رعاية الإنسان . إنهم لا يملكون إجابات نهائية ولكن كما سنرى في آخر الفصل بحث علماء النفس في مناطق مثل الحكم وصنع القرار ، الاضطرابات النفسية ، الذاكرة ، التوتر والمواجهة ، الإدراك الاجتماعي حقق قرائن ونظريات عن لماذا يفكر الناس ، الإحساس ، والتصرف

هذا البحث يخبرنا جزء من قصة علم النفس ولكن هناك الكثير . نحن كتبنا هذا الكتاب لإعطائك معرفة أفضل عن علم النفس ودراسة علماء النفس وأين وكيف يعملون وماذا اكتشفوا ولم يكتشفوا إلى الآن . وكيف طبقت اكتشافاتهم عمليا ، وفي هذا الجزء سنعرض نظرة عامة عن علم النفس وأنواع علم النفس المعاصر ويتضمن اختلاف المنهاج لفهم الظواهر النفسية والعديد من الحقائق الفرعية في عمل علماء النفس .

Verb Tenses and Writing Styles

Taking time to analyze patterns in verb tenses as you read can aid your comprehension. In academic texts, past tense forms are used for discussing past events, observations, experiment results, case studies, descriptions of past work, and conclusions. This is called narrative style. To bring a present or more immediate focus to texts, with reports, discussions, and generalizations, writers use present, present perfect, and future forms including modals. This is called expository style. It is writing to give information or an explanation of difficult material.

صيغ الأفعال وأساليب الكتابة

أخذ الوقت لتحليل الأنماط في الأزمنة كما قرأت، يمكن أن يساعد استيعابك في النصوص الأكademية، تستخدم أشكال الفعل الماضي لمناقشة الأحداث الماضية، والملحوظات، ونتائج التجربة، ودراسات الحالة، ووصف الأعمال السابقة، والاستنتاجات. ويسمى هذا أسلوب السرد. لجلب التركيز الحالي أو الأكثر فورية للنصوص، مع التقارير والمناقشات، والتعليقات، الكتاب يستخدمون الحالي والحاضر التام، والمستقبل بما في ذلك أشكال شرطية. وهذا ما يسمى بالأسلوب التفسيري. إنها كتابة لإعطاء معلومات أو شرحاً لصعوبة المادة.

STRATEGY

Reading Chapter Outlines

Taking the time to read a chapter outline before you read a textbook chapter puts you in the driver's seat. Looking at a map before you take a trip helps you to make navigation decisions as you travel. Chapter outlines are like maps. Reading them carefully lets you know what lies ahead.

قراءة الخطوط العريضة للفصل

أخذ الوقت لقراءة الخطوط العريضة للفصل قبل أن تقرأ فصل الكتاب يضعك في مقدار السائق. تبحث في الخريطة قبل أخذ رحلة سيساعدك على اتخاذ قرارات ملاحية أثناء سفرك. الخطوط العريضة للفصل هي مثل الخرائط. قرائتها بعناية يتيح لك معرفة ما ينتظرك في المستقبل.



Chapter 7: Memory	
OUTLINE	
The Nature of Memory	
Basic Memory Processes	
Types of Memory	
Explicit and Implicit Memory	
Focus on Research Methods: Measuring Explicit Versus Implicit Memory	
Models of Memory	
Acquiring New Memories	
Sensory Memory	
Short-term, or Working, Memory	
Long-Term Memory	
Distinguishing Between Long-Term and Short-Term Memory	
Retrieving Memories	
Retrieval Cues and Encoding Specificity	
Context and State Dependence	
Retrieval from Semantic Memory	
Constructing Memories	
Thinking Critically: Recovered Memories—True or False?	
Forgetting	
The Course of Forgetting	
The Roles of Decay and Interference	
Linkages: Memory and Perception in the Courtroom	
Biological Bases of Memory	
Biochemical Mechanisms	
Brain Structures	
Application of Memory Research	
Improving Your Memory	
Design for Memory	
Linkages	
Summary	
Key Terms	



الفصل ٧: الذاكرة	
الخطوط العريضة	
طبيعة الذاكرة	
عمليات الذاكرة الأساسية	
أنواع الذاكرة	
الذاكرة الصريحة والضمنية	
التركيز على مناهج البحث: قياس الذاكرة الصريحة مقابل الضمنية	
نماذج الذاكرة	
اكتساب ذكريات جديدة	
الذاكرة الحسية	
الذاكرة قصيرة الأجل أو العاملة	
ذاكرة طويلة الأجل	
التمييز بين الذاكرة طويلة الأجل وقصيرة الأجل	
استرجاع الذكريات	
استعادة الإشارات وخصوصية الترميز	
السياق، والاتكال على الدولة	
استرجاع من الذاكرة الدلالية	
بناء الذكريات	
التفكير الناقد: الذكريات المستردة - حق أو باطل؟	
النسوان	
مسار النساء	
أدوار الانحطاط والتدخل	
الرابط: الذاكرة والإدراك في قاعة المحكمة	
أسس الذاكرة البيولوجية	
الآليات الكيميائية الحيوية	
تركيبات الدماغ	
تطبيق بحث الذاكرة	
تحسين ذاكرتك	
التصميم للذاكرة	
الرابط	
ملخص	
مفتاح النون (http://www.kaues.org)	

CHAPTER 7: MEMORY

¹ Several years ago an air traffic controller at Los Angeles International Airport cleared a US Airways flight to land on runway 24L. A couple of minutes later, the US Airways pilot radioed the control tower that he was on approach for 24L, but the controller did not reply because she was preoccupied by a confusing exchange with another pilot. After finishing that conversation the controller told a Sky West commuter pilot to taxi onto runway 24L for takeoff, completely forgetting about the US Airways flight that was about to land on the same runway. The US Airways jet hit the commuter plane, killing thirty-four people. The controller's forgetting was so complete that she assumed the fireball from the crash was an exploding bomb. How could the controller's memory have failed her at such a special time?

² Memory is full of paradoxes. It is common, for example, for people to remember the name of their first grade teacher, but not the name of someone they just met a minute ago. And consider Rajan Mahadevan. He once set a world's record by reciting from memory the first 31,811 places for pi (the ratio of the circumference of a circle to its diameter), but on repeated visits to the psychology building at the University of Minnesota, he had trouble recalling the location of the nearest restroom (Biederman et al., 1992). Like perception, memory is selective. Whereas people retain a great deal of information, they also lose a great deal (Bjork & Vanhuele, 1992).

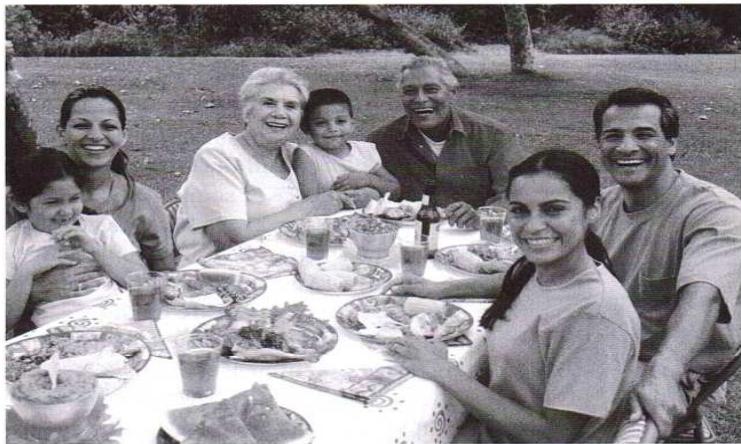
الفصل ٧: الذاكرة

منذ عدة سنوات مضت كانت مراقبة الحركة الجوية في مطار لوس انجلوس الدولي قد سمحت لرحلة الخطوط الجوية الأمريكية بالهبوط على مدرج 24I وبعد بضعة دقائق اتصل طيار الخطوط الجوية الأمريكية ببرج المراقبة وقال بأنه كان على مدرج 24I ولكن المراقبة لم ترد عليه لأنها كانت مشغولة بتبادل اتصال مركب مع طيار آخر ، وبعد إنهاء تلك المحادثة أخبرت المراقبة طيار (سكاي وست) بنقل الركاب إلى التاكسي للمدرج 24I للإقلاع ، نسيت تماما رحلة الخطوط الجوية الأمريكية والتي كانت على وشك الهبوط في نفس المدرج . فضربت رحلة الخطوط الأمريكية طائرة ركاب (سكاي وست) فقتل ٣٤ شخصا ، نسيت المراقبة الأمر بالكامل وافتراضت أن كرة النار المشتعلة كانت من أثر انفجار قنبلة .

كيف يمكن لذاكرة المراقبة الفشل في مثل هذا الوقت الخاص ؟

الذاكرة مليئة بالمقارنات. فمن الشائع، على سبيل المثال، للناس على تذكر اسم معلمهم الصف الأول، ولكن ليس اسم شخص اجتمعوا به قبل دقيقة واحدة فقط. وبالنظر إلى راجان ماهايديفان. انه عندما ضبط السجل العالمي بقراءة من الذاكرة لأول ٣١٨١١ مكان لـ PI (نسبة محيط الدائرة إلى قطرها)، ولكن في الزيارات المتكررة لمبني علم النفس في جامعة مينيسوتا، كان يجد صعوبة في الإشارة إلى مكان أقرب حمام (بيدرمان وآخرون، ١٩٩٢). مثل الإدراك، والذاكرة بأنها انتقائية. في حين أن الناس تحفظ بقدر كبير من المعلومات، فإنهم سيخسرون أيضا الكثير (بيورك وVanhuele، 1992).

3 Memory plays a critical role in your life. Without memory, you would not know how to shut off your alarm clock, take a shower, get dressed, or recognize objects. You would be unable to communicate with other people because you would not remember what words mean, or even what you had just said. You would be unaware of your own likes and dislikes, and you would have no idea who you are in any meaningful sense (Kihlstrom, 1993). In this chapter we describe what is known about both memory and forgetting. First, we discuss what memory is—the different kinds of memory, and the different ways we remember things. Then we examine how new memories are acquired and later recalled, and why they are sometimes forgotten. We continue with a discussion of the biological bases of memory, and we conclude with some practical advice for improving memory and study skills.



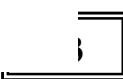
Drawing on Memories: The human memory system allows people to encode, store, and retrieve a lifetime of experiences. Without it, you would have no sense of who you are.

The Nature of Memory

4 Mathematician John Griffith estimated that, in an average lifetime, a person will have stored roughly five hundred times as much information as can be found in all of the volumes of the *Encyclopedia Britannica* (Hunt, 1982). The impressive capacity of human memory depends on the operation of a complex mental system (Schacter, 1999).

تلعب الذاكرة دورا حاسما في حياتك ، بدون الذاكرة لن تعرف كيف تغلق ساعة منبهك ، أخذ حمام ،ليس ، معرفة الأشياء ، لن تكون قادر على الاتصال مع الآخرين لأنك لن تتمكن معايير الكلمات ، أو حتى ما الذي قد قيل ، ستكون غير مدرك للذى تحب والذى تكره ، ولن تملك أي فكرة عن نفسك في أي إحساس ذو مغزى .

في هذا الباب سنصف ما هو معروف عن كل من الذاكرة والنسينان **أولا** : نناقش ما هي الذاكرة ، أنواع الذاكرة ، والطرق المختلفة لتنمية الذاكرة للأشياء ، وبعد ذلك نبحث في كيف نكتب الذاكرة الجديدة وتنميها ولماذا بعض الأحيان ننسى ، ونستمر في النقاش في القواعد البيولوجية للذاكرة ونخت ببعض النصائح العلمية لتطوير الذاكرة ومهارات الدراسة.



طبيعة الذاكرة : عالم الرياضيات (جون فريفيث) حمن أن شخص في متوسط العمر يستطيع تخزين ما يقارب خمسماة مرة المعلومات الموجودة في كل مجلدات الموسوعة البريطانية.

السعة المثيرة للإعجاب للذاكرة البشرية تعتمد على تشغيل النظام العقلي المعق

Basic Memory Processes

5 We know a psychologist who sometimes drives to work and sometimes walks. On one occasion, he drove, forgot that he had driven, and walked home. When he failed to find his car in its normal spot the next morning, he reported the car stolen. The police soon called to say that "some college kids" had probably stolen the car because it was found on campus (next to the psychology building!). What went wrong? There are several possibilities, because memory depends on three basic processes—encoding, storage, and retrieval (see Figure 7.1).

6 First, information must be put into memory, a step that requires **encoding**. Just as incoming sensory information must be coded so that it can be communicated to the brain, information to be remembered must be put in a form that the memory system can accept and use. In the memory system, sensory information is put into various *memory codes*, which are mental representations of physical stimuli. Imagine that you see a billboard¹ that reads "Huey's Going Out of Business Sale," and you want to remember it so you can take advantage of the sale later. If you encode the sounds of the words as if they had been spoken, you are using **acoustic encoding**, and the information is represented in your memory as a sequence of sounds. If you encode the image of the letters as they were arranged on the sign, you are using **visual encoding**, and the information is represented in your memory as a picture. Finally, if you encode the fact that you saw an ad for Huey's you are using **semantic encoding**, and the information is represented in your memory by its general meaning. The type of encoding used can influence what is remembered. For example, semantic encoding might allow you to remember that a car was parked in your neighbors' driveway just before their house was robbed. If there was little or no encoding, you might not be able to remember the make, model, or color of the car.

1. **bill·board** (bīl'bōrd', -bōrd') *n.* A large upright board used to display advertisements in public places and alongside highways.

العمليات الأساسية للذاكرة

نحن نعرف عالم نفس كان في بعض الأحيان يقود سيارته إلى العمل وبعض الأحيان يذهب مأشياً ، في إحدى المرات كان قد ذهب بسيارته إلى العمل ونسى انه كان يقودها فعاد إلى المنزل مأشياً وعندما فشل في إيجاد سيارته في اليوم التالي في موقعها الطبيعي أبلغ أن سيارته قد سرقت وبعد فترة وجيزة اتصلت الشرطة لتقول " بعض أطفال الكلية " قد سرقوا السيارة لأنها وجدت في الحرم الجامعي مقابل مبني علم النفس !! ولكن ما هذا الخطأ؟ هناك إمكانيات عديدة لأن الذاكرة تعتمد على ثلاثة عمليات أساسية **الترميز** -

التخزين - الاسترجاع

أولاً : المعلومات لابد أن توضع بداخل الذاكرة وهذه الخطوة تتطلب (الترميز) تماماً مثل المعلومات الحسية المدخلة لابد أن ترمز بحيث يمكن أن ترسل إلى الدماغ .

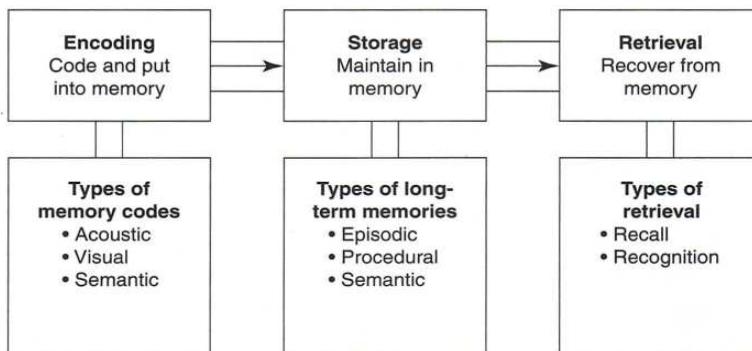
المعلومات لتنفذ يجب أن توضع في شكل يمكن لنظام الذاكرة الموافقة عليه واستخدامها ، في نظام الذاكرة المعلومات الحسية توضع في ترميزات ذاكرة مختلفة وعي تمثيلات عقلية للمحفزات الفيزيائية ، تخيل أنهك ترى لوحة اعلانات وقرأت " خروج هيوي من أعمال البيع " وترى أن تذكرها يمكنك الاستفادة من البيع لاحقاً .

إذا رممت أصوات الكلمات كما نطقت فأنك تستخدم **الترميز الصوتي** والمعلومات في ذاكرتك كسلسلة للأصوات وإذا رممت صورة الأحرف كما ربت في الإشارة فأنك تستخدم **الترميز البصري** والمعلومات تمثل في ذاكرتك بصورة وإذا رممت الواقع الذي رأيته في الإعلان فأنك تستخدم **الترميز الدلالي** والمعلومات تعرض في ذاكرتك عبر معناها العام ، نوع الترميز المستخدم يمكن أن يؤثر على ما تذكر ، على سبيل المثال الترميز الدلالي قد يسمح لك أن تذكر السيارة التي كانت متوقفة في ممر جيرانك قبل أن يسرق منزلهم ، وإذا كان هناك قليل من الترميز أو ترميز معروم فأنك لن تكون قادر على تذكر طراز السيارة والموديل أو اللون .

7 The second basic memory process is **storage**, which refers to the maintenance of information over time, often over a very long time. When you find it possible to use a pogo stick² or to recall a vacation from many years ago, you are depending on the storage capacity of your memory.

8 The third process, **retrieval**, occurs when you locate information stored in memory and bring it to consciousness. Retrieving stored information such as your address or telephone number is usually so fast and effortless that it seems **automatic**. Only when you try to retrieve other kinds of information—such as the answer to a quiz question that you know but cannot quite recall—do you become aware of the searching process. Retrieval processes include both recall and recognition. To *recall* information, as on an essay test, you have to retrieve it from memory without much help. *Recognition* is retrieval aided by clues, such as alternatives given in a multiple-choice test item. Accordingly, recognition tends to be easier than recall.

Figure 7.1
Basic Memory Processes



Remembering something requires first that the items be encoded—put in a form that can be placed in memory. It must then be stored and, finally, retrieved, or recovered. If any of these processes fails, forgetting will occur.

2. **pogo stick** (pō'gō stik) *n.* A stick with handles, a spring, and footrests used to propel oneself along the ground by hopping.

عملية الذاكرة الأساسية الثانية : هي **التخزين** والتي تشير إلى الاحتفاظ بالمعلومة وقت أطول وفي كثير من الأحيان وقت طويل جدا ، عندما تجد أن انه يمكنك استخدام أن تذكر عطلة من سنين عديدة فأنك تعتمد على سعة **التخزين** لذاكرتك .

العملية الثالثة : **الاسترجاع** وتحدث عند تحديد معلومة مخزنة في الذاكرة واسترجاعها للوعي . إن استرجاع المعلومات المخزنة مثل عنوانك أو رقم تلفون يبدو وكأنه جهد ثقاني . فقط عندما تحاول استرجاع أنواع أخرى من المعلومات مثل إجابة على سؤال الاختبار الذي تعرفه ولكن لا يمكن استرجاعه بشكل كامل فتصبح مدرك لعملية البحث .

عملية الاسترجاع تتضمن كلًا من التذكر والتمييز ، لتذكر معلومة مثلاً في اختبار المقالة فأنك تسترجعها من الذاكرة بدون الكثير من المساعدة . التمييز : يسترجع بمساعدة من الأدلة مثل البانل الواردة في اختبار الخيارات المتعددة (التمييز يميل إلى السهولة أكثر من التذكر) .



تذكرة شيء ما يتطلب أولاً أن تكون البنود مشفرة، وموضوعه في شكل يمكن وضعه في الذاكرة . ويجب من ثم أن يتم تخزينها واسترجاعها في النهاية، أو استردادها. إذا فشل أي من هذه العمليات، النسيان سوف يحدث.

Types of Memory

9 When was the last time you made a credit card purchase? What part of speech is used to modify a noun? How do you keep your balance when you are skiing? To answer these questions you must use your memory. However, each may require a different type of memory (Brewer & Pani, 1984). To answer the first question, you must remember a particular event in your life; to answer the second one, you must recall a piece of general knowledge that is unlikely to be tied to a specific event. And the answer to the final question is difficult to put into words but appears in the form of your remembered actions when you get up on skis. How many types of memory are there? No one is sure, but most research suggests that there are at least three basic types. Each is named for the kind of information it handles (Reed, 1992).

10 Memory of a specific event that happened while you were present—that is, during an “episode” in your life—is called **episodic memory**. Examples are what you had for dinner yesterday, what you did last summer, or where you were last Friday night. Generalized knowledge of the world that does not involve a specific event is called **semantic memory**. For instance, you can answer a question like “Are wrenches pets or tools?” without remembering any specific event in which you learned that wrenches are tools. As a general rule, people convey episodic memories by saying, “I remember when ...,” whereas they convey semantic memories by saying, “I know that ...” (Tulving, 1982). Finally, memory of how to do things, such as skiing without falling (and riding a bike, reading a map, tying a shoelace) is called **procedural memory**. Often procedural memory consists of a complicated sequence of movements that cannot be described adequately in words. For example, a gymnast might find it impossible to describe the exact motions in a particular routine.

11 Many activities require all three types of memory. Consider the game of tennis. Knowing the official rules, or how many sets are needed to win a match involves semantic memory. Remembering which side served last requires episodic memory. Knowing how to lob or volley involves procedural memory.



أنواع الذاكرة
متى كانت آخر مرة قمت بالشراء بالبطاقة الائتمانية؟ ما هو الخطاب المستخدم لتعديل الاسم؟ كيف تحافظ على توازنك عندما تزلج؟
لإجابة على هذه الأسئلة يجب أن تستخدم ذاكرتك ، ومع ذلك كل إجابة تحتاج إلى نوع مختلف من الذاكرة .

لإجابة على السؤال الأول يجب أن تذكر حادثة معينة في حياتك للإجابة على السؤال الثاني يجب أن تذكر جزء من معرفة عامة من غير المرجح أن تكون مرتبطة بحدث معين
لإجابة على السؤال الأخير فمن الصعب وضعها في كلمات ولكنه يبدو في شكل أفعالك المتنكرة .
كم نوع من الذاكرة هناك؟ ليس هناك من هو متأكد ، ولكن معظم الأبحاث تشير إلى أن هناك على الأقل أنواع أساسية كل واحدة سميت بنوع المعلومات التي تتولاها .

ذاكرة الأحداث المعينة التي حدثت بينما أنت حاضر وذلك من خلال حادثة في حياتك تسمى الذاكرة العرضية
على سبيل المثال ماذا كان لديك للعشاء أمس ؟
ماذا فعلت في الصيف الماضي؟ أن كنت في ليلة آخر جمعة ؟
المعرفة العامة للعالم والتي لا تحتوي على أحداث معينة (خاصة) تسمى الذاكرة الدلالية ، بدليل انك تستطيع الإجابة على ” هل البراغي معدات أم حيوانات أليفة ؟ ”

بدون تذكر أي أحداث معينة فأنك تعلم أن البراغي معدات
كقاعدة عامة : تنقل الذكريات العرضية بقول ” أنا أتذكر عندما ” تنقل الذكريات الدلالية بقول ” أنا أعرف أن ” .
ذاكرة كيف تفعل الأشياء مثل التزلج بدون السقوط تسمى الذاكرة الإجرائية ، حتى الذاكرة الإجرائية تحتوي على تسلسل معدن لحركات لا يمكن وصفها
وصف كاف في كلمات على سبيل المثال : الجمباز قد تجد انه من المستحيل أن يوصف الحركات تماما في روتين معين .

بعض الأنشطة تتطلب كل الأنواع الثلاثة من الذاكرة ، بالنظر إلى لعبه التنس ، معرفة القواعد الرسمية وكم مجموعة تحتاج للفوز تتطوّر تحت الذاكرة الدلالية ، وأي جانب يشارك تحتاج ذاكرة عرضية ، ومعرفة كيف تضرب الكرة تحتاج لذاكرة إجرائية .

Linkages**Learning by Doing**

Procedural memories involve skills that can usually be learned only through repetition. This is why parents not only tell children how to tie a shoe but also show them the steps and let them practice. Factors that enhance skill learning are described in Chapter 6.

Explicit and Implicit Memory

¹² Memory can be categorized in terms of its effects on thoughts and behaviors. For example, you make use of **explicit memory** when you deliberately try to remember something and are consciously aware of doing so (Masson & MacLeod, 1992). Let's say that someone asks you about your last vacation; as you attempt to remember where you went, you would be using explicit memory to recall this episode from your past. Similarly, if you have to answer a question on an examination, you would be using explicit memory to retrieve the information needed to give the correct answer. In contrast, **implicit memory** is the unintentional recollection and influence of prior experiences (Nelson, 1999). For example, while watching a movie about a long car trip, you might begin to feel tense because you subconsciously recall the time you had engine trouble on such a trip. But you are not aware that it is this memory that is making you tense. Implicit memory operates automatically and without conscious effort. As another example, perhaps you've found yourself disliking someone you just met, but didn't know why. One explanation is that implicit memory may have been at work. Specifically, you may have reacted in this way because the person bears a resemblance to someone from your past who treated you badly. In such instances, people are usually unable to recall the person from the past and, indeed, are unaware of any connection between the two individuals (Lewicki, 1985). Episodic, semantic, and procedural memories can be explicit or implicit, but procedural memory usually operates implicitly. This is why, for example, you can skillfully ride a bike even though you cannot explicitly remember all of the procedures necessary to do so.

¹³ It is not surprising that experience affects how people behave. What is surprising is that they are often unaware that their actions

الروابط**التعلم بالمارسة**

الذاكرة الإجرائية تشمل المهارات التي يمكن في العادة تعلمها فقط من خلال التكرار. هذا هو السبب في أن الأهل لا يخبرون الأطفال حول كيفية ربط الحذاء فقط، ولكن أيضاً يرونهم الخطوات والسماح لهم بالمارسة. وتم وصف العوامل التي تعزز مهارة التعلم في الفصل ٦.

الذاكرة الضمنية والذاكرة الصريحة : يمكن أن نقسم الذاكرة إلى أجزاء من حيث تأثيرها في الأفكار والسلوك ، على سبيل المثال : أنت تستخدم الذاكرة الصريحة عندما تحاول تذكر شيء لعمله بإدراك ووعي دعنا نقول أن شخص ما سألك عن آخر عطلة لك ، ولمحالة تذكر أين ذهبت فبإمكانك استخدام الذاكرة الصريحة لتذكر هذا الحدث العرضي في حياتك وتماماً عندما تحاول الإجابة على سؤال في الاختبار فإنك تستخدم الذاكرة الصريحة لاسترجاع المعلومة المطلوبة لتطبي إجابة صحيحة .

وعلى النقيض الذاكرة الضمنية هي ذكرى غير مقصودة وتوثر على التجارب السابقة . على سبيل المثال / عندما تشاهد فيلم عن رحلة سيارة طويلة فقد تبدأ بالشعور بالتوتر لأنك تذكر متى كان لديك مشكلة في المحرك في رحلة من هذا القبيل ، ولكنك لا تدرك ما هي الذاكرة التي صنعت هذا التوتر

الذاكرة الضمنية تعمل تلقائياً وبدون جهد واعي ، مثال آخر / ربما تجد شخصاً لا تجده وتأتيه به للتو ولكنك لا تعلم لماذا ، تفسير واحد هو أن الذاكرة الضمنية قد تمت في مكان العمل ، على وجه التحديد قد يكون رد فعل بهذه الطريقة لأن الشخص يشبهه من عالجك في الماضي بطريقة سيئة ، وفي هذه الحالة الناس عادة غير قادرین على تذكر شخص من الماضي والواقع أنهم غير مدرkin أي اتصال بين الشخصين .

الذكريات العرضية والدلائلية والإجرائية قد تكون صريحة أو ضمنية ولكن الذاكرة الإجرائية عادة تعمل ضمنياً

هذا هو السبب ، فعلى سبيل المثال نستطيع إتقان ركوب الدراجة وعلى الرغم من عدم تذكرنا بصرامة كل الإجراءات الضرورية لعملها .

إنها ليست مفاجأة أن التجربة تؤثر في كيفية تصرف الناس ، ما هي المفاجأة ، هي التي لا يدركون عادةً بأن حركاتهم

have been influenced by previous events. Because some influential events cannot be recalled even when people try to do so, implicit memory has been said to involve "retention without remembering" (Roediger, 1990).



Making Implicit Memories: By the time they reach adulthood, these children may have no explicit memory of the interaction they had in early childhood with friends from differing ethnic groups, but research suggests that their implicit memories of such experiences could have an unconscious effect on their attitudes toward judgments about members of those groups.

Focus on Research Methods:

Measuring Explicit Versus Implicit Memory

¹⁴ In Canada, Endel Tulving and his colleagues undertook a series of experiments to map the differences between explicit and implicit memory (Tulving, Schacter, & Stark, 1982).

■ **What was the researcher's question?**

¹⁵ Tulving knew he could measure explicit memory by giving a recognition test in which participants simply said which words on a list they remembered seeing on a previous list. The question was, How would it be possible to measure implicit memory?

تلك تأثرت بأحداث سابقة. لأن بعض الأحداث المؤثرة لا يستطيعون تذكرها عندما يحاولون فعلها . الذاكرة الضمنية تشمل مقوله " الاحفاظ بدون استذكار "



التركيز على مناهج البحث

قياس الذاكرة الضمنية مقابل الذاكرة الصريحة :
في كندا ، (ليندل تولفينق) وزملاءه أجروا تجارب عديدة لرسم الاختلافات بين الذاكرة الضمنية والصريحة .

ماذا كانت اسئلة الباحثين :

عرف (تولفينق) انه استطاع قياس الذاكرة الضمنية عبر إعطاء اختبار التمييز والذي قال ببساطة للمشتركين فيه عن الكلمات التي تذكروها في القائمة السابقة التي رأوها .

السؤال كان : كيف من الممكن قياس الذاكرة الضمنية ؟

■ How did the researcher answer the question?

16 First, Tulving asked the participants in his experiment to study a long list of words—the “study list.” An hour later, they took a recognition test involving explicit memory—saying which words on a new list had been on the original study list. Then, to test their implicit memory, Tulving asked them to perform a “fragment completion” task (Warrington & Weiskrantz, 1970). In this task, participants were shown a “test list” of word fragments such as *d-l-iu*, and asked to complete the word (in this case *delirium*). On the basis of *priming* studies such as those described in Chapter 9, Tulving assumed that memory from a previous exposure to the correct word would improve the participants’ ability to complete the fragment, even if they were unable to consciously recall having seen the word before. A week later, all participants took a second test of their explicit memory (recognition) and implicit memory (fragment completion) of the study list. Some of the words on this second test list had been on the original study list, but none had been used in the first set of memory tests. The independent variable in this experiment, then, was the amount of time that elapsed since the participants read the study list (one hour versus one week), and the dependent variable was performance on each of the two types of memory tests, explicit and implicit.

■ What did the researcher find?

17 As shown in Figure 7.2, explicit memory for the study list decreased dramatically over time, but implicit memory was virtually unchanged. Results from several other experiments also show that the passage of time affects one type of memory but not the other (Komatsu & Naito, 1992; Mitchell, 1991). For example, it appears that the aging process has fewer negative effects on implicit memory than explicit memory (Light, 1991).

■ What do the results mean?

18 The work of Tulving and others supports the idea of disassociation, or independence between explicit and implicit memory, suggesting that the two may operate on different principles (Gabrieli et al., 1995). Indeed, some researchers believe that explicit and implicit memory may involve the activity of distinct neural systems in the brain (Squire, 1987; Tulving & Schacter, 1990).

كيف أجاب الباحثين عن السؤال :

أولاً : (تولفينق) سأله المشاركون في تجربته دراسة قائمة طويلة من الأسماء وبعد ساعة أخذوا اختبار التمييز في الذاكرة الصريحة، أي الكلمات في القائمة الجديدة كانت في القائمة الأصلية . وبعد ذلك ولاختبار ذاكرتهم الضمنية سألهم (تولفينق) مهمة إنهاء الجزء ، في هذه المهمة رأى المشاركون قائمة الاختبار لأجزاء الكلمة مثل :

d-l_iu

وأثناء أكمال الكلمة ، أفترض (تولفينق) أن تعرض الذاكرة السابقة للكلمة الصحيحة يمكن أن يطور قدرة المشاركون لإكمال الجزء ، وحتى ولو كان غير قادرین على تذكر الكلمة من قبل ، وبعد أسبوع كل المشاركون أخذوا اختبار ذاكرتهم الصريحة الضمنية ، (إكمال الجزء) لقائمة الدراسة بعض الكلمات في الثاني كانت في القائمة الأصلية ولكنها لم تستخدم في اختبارات الذاكرة الأولى .

المتغير المستقل في هذه التجربة كان كمية الوقت الذي انقضى منذ قراءة المشاركون قائمة الدراسة (ساعة واحدة مقابل أسبوع) المتغير التابع كان الأداء على كل من اختبارات الذاكرة صريحة ، ضمنية .

ماذا وجد الباحثون ؟

قائمة دراسة الذاكرة الصريحة انخفضت بشكل كبير على مر الزمن ولكن الذاكرة الضمنية لم تتغير فعلياً . والنتائج من تجارب أخرى أظهرت انه مع مرور الوقت يتاثر نوع من الذاكرة والآخر لا يتاثر ، ويبدو أن عملية الشيخوخة لها تأثير سلبي أقل على الذاكرة الضمنية منه على الذاكرة الصريحة .

ماذا تعني النتائج :

عمل (تولفينق) والآخرين يدعم فكرة الاختلاف أو الاستقلال بين الذاكرة الصريحة والضمنية ويشير إلى أن كل واحدة تعمل بمبادئ مختلفة . في الواقع بعض الباحثين يعتقدون أن الذاكرة الصريحة والضمنية ربما تنطوي على نشاط وأنظمة عقلية متميزة في الدماغ .

■ What do we still need to know?

19 Psychologists are now studying the role of *implicit memory* (and disassociations between explicit and implicit memory) in such important psychological phenomena as amnesia (Schacter, Church, & Treadwell, 1994; Tulving, 1993), depression (Elliot & Greene, 1992), problem solving (Jacoby, Marriot, & Collins, 1990), prejudice and stereotyping (Fiske, 1998), the development of self-concept in childhood (Nelson, 1993), and even the power of ads to associate brand names with good feelings (Duke & Carlson, 1993). The results of these studies shed new light on *implicit memory* and how it operates in the real world.

20 While some researchers claim that *implicit memory* and *explicit memory* involve different structures in the brain (Schacter, 1992; Squire, 1987; Tulving & Schacter, 1990), others argue that the two types of memory entail different cognitive processes (Nelson, McKinney, & Bennett, in press; Roediger, Guynn, & Jones, 1995). Indeed, some social psychologists are trying to determine whether consciously held *attitudes* are independent of *implicit social cognitions*—past experiences that unconsciously influence a person's judgments about a group of people (Greenwald & Banaji, 1995). A case in point would be a person whose *explicit thoughts* about members of some *ethnic group* are *positive*, but whose *implicit thoughts* are *negative*. Early work on *implicit memory* for stereotypes seemed to indicate that *explicit* and *implicit stereotypes* are indeed independent (Devine, 1989), but more recent research suggests that they are to some extent related (Lepore & Brown, 1997). Further research is needed to determine what mechanisms are responsible for *implicit* versus *explicit memory* and how they are related to one another (Nelson et al., in press).

ما الذي بقي أن نعرفه :

علماء النفس الان يدرسون دور الذاكرة الضمنية والاختلافات بينها وبين الصريحة مثل أهم الظواهر الفسيولوجية كالنسيان (فقدان الذاكرة) ، الكآبة ، حل المشاكل ، التحيز والنمطية ، تطوير مفهوم الذات والطفولة ، وحتى قوة الإعلانات وأسماء الماركات والشعور الجيد .

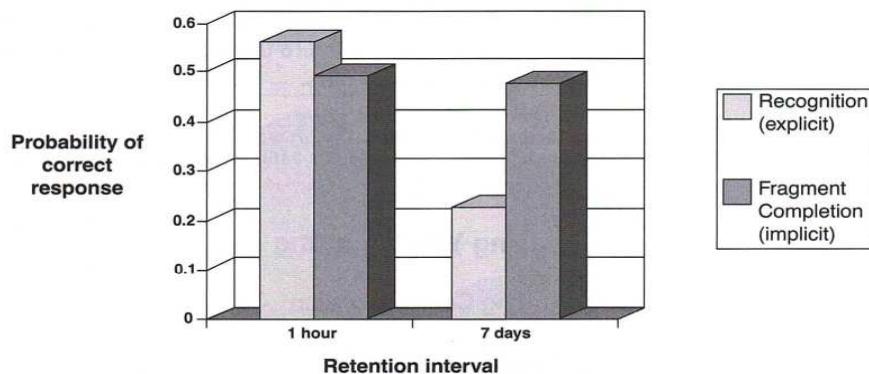
النتائج لهذه الدراسات سلطت الضوء على الذاكرة الضمنية وكيف تعمل في العالم الحقيقي ، بينما بعض الباحثين أدعوا أن الذاكرة الصريحة والضمنية تحتوي على هيكل مختلف في الدماغ والآخرين ادعوا أنها تتبع عمليات إدراكية مختلفة .

في الواقع بعض علماء النفس الاجتماعي يحاولون تحديد المواقف التي عقدت

بوعي مستقل للإدراك الاجتماعي الضمني التجارب الماضية لا تؤثر في إحكام الشخص على مجموعة من الناس وهناك مثال على ذلك أن الشخص الذي يعتقد صراحة عن أعضاء لمجموعة عرقية أنهم ايجابيين بينما يعتقد ضمنيا أنهم سلبيين ، في وقت مبكر على الذاكرة الضمنية في قوالب نمطية للإشارة أن تلك القوالب في الواقع مستقلة ولكن مزيد من البحوث الأخيرة تشير إلى حد ما أن هناك صلة بينهما وأخيراً : هناك حاجة لمزيد من البحوث لتحديد ما هي آليات ومسؤولية الذاكرة الضمنية مقابل الصريحة وكيف تكون علاقة إدراهما بالآخر .

Figure 7.1

Measures of Explicit and Implicit Memory



This experiment showed that the passage of time greatly affected people's recognition (explicit memory) of a word list but left fragment completion (implicit memory) essentially in tact. Results such as these suggest that explicit and implicit memory may be different memory.

Source: Bernstein, D. A., Clark-Stewart, A., Penner, L. A., Roy, E. J., & Wickens, C. D. (2000). Psychology (5th ed.) (pp. 214–218). Boston: Houghton Mifflin Company.

Summary

The Nature of Memory

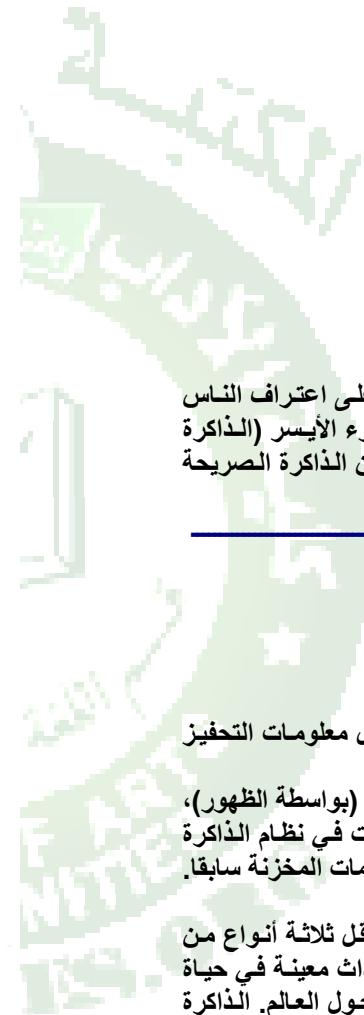
21 Human memory depends on a complex mental system.

Basic Memory Processes

22 There are three basic memory processes. *Encoding* transforms stimulus information into some type of mental representation. Encoding can be *acoustic* (by sound), *visual* (by appearance), or *semantic* (by meaning). *Storage* maintains information in the memory system over time. *Retrieval* is the process of gaining access to previously stored information.

Types of Memory

23 Most psychologists agree that there are at least three types of memory. *Episodic memory* contains information about specific events in a person's life. *Semantic memory* contains generalized knowledge about the world. *Procedural memory* contains information about how to do various things.



فترة الاحتفاظ

أظهرت هذه التجربة أن مرور الوقت أثر بشكل كبير على اعتراف الناس (الذاكرة الواضحة) من قسمة الكلمات ولكن إتمام الجزء الأيسر (الذاكرة الضمنية) أساسا في البراعة. مثل هذه النتائج تشير إلى أن الذاكرة الصريحة والضمنية قد تكون ذاكرة مختلفة.

ملخص

طبيعة الذاكرة

الذاكرة الإنسانية تعتمد على نظام عقلي معقد.

عمليات الذاكرة الأساسية

هناك ثلاثة عمليات للذاكرة الأساسية. الترميز يحول معلومات التحفيز إلى نوع من التمثيل العقلي.

الترميز يمكن أن يكون صوتي (بواسطة الصوت)، بصري (بواسطة الظهور)، أو دلالي (بواسطة المعنى). التخزين يحافظ على المعلومات في نظام الذاكرة على مر الزمن. الاسترجاع هو عملية للحصول على المعلومات المخزنة سابقا.

أنواع الذاكرة

معظم علماء النفس يتفقون على أن هناك على الأقل ثلاثة أنواع من الذاكرة. الذاكرة العرضية تحتوي على معلومات حول أحداث معينة في حياة الشخص. الذاكرة الدلالية تحتوي على المعرفة المعممة حول العالم. الذاكرة الإجرائية تحتوي على معلومات حول كيفية القيام بأشياء مختلفة.

Muscle
Reading
Reminder

Phase Three:
Recite
Review
Review
Again

Explicit and Implicit Memory

24 Most research on memory has concerned *explicit memory*, the processes through which people deliberately try to remember something. Recently, psychologists have also begun to examine *implicit memory*, which refers to unintentional recollection and influence of prior experiences.

Source: Bernstein, D. A., Clark-Stewart, A., Penner, L. A., Roy, E. J., & Wickens, C. D. (2000). *Psychology* (5th ed.) (p. 246). Boston: Houghton Mifflin Company.

الذاكرة الصريحة والضمنية

معظم البحث في الذاكرة لديها ذاكرة معنية، والعمليات التي من خلالها الناس يحاولون عمداً لتنكر شيئاً. مؤخراً، بدأ علماء النفس أيضاً إلى فحص الذاكرة الضمنية، التي تشير إلى تذكر غير مقصود ونفوذ من التجارب السابقة.



STRATEGY

Noticing Collocations

Whenever you encounter new words, think about which words commonly collocate with your new words. Understanding word associations can help you learn, remember, and use new words.

ملاحظة الكلمات المتلازمة

كلما واجهت كلمة جديدة، فكر في أي الكلمات التي ترتب عموماً مع كلماتك الجديدة. فهم جمعيات الكلمة يمكن أن تساعدك على التعلم، والتذكر، واستخدام كلمات جديدة.



Reading Selection 1

OUR CHANGING ENVIRONMENT

Environmental Science

1 How humans can best live within the Earth's environment is the theme of what is loosely called environmental science, the interdisciplinary study of humanity's relationship with other organisms¹ and the non-living physical environment. Environmental science is interdisciplinary because it uses and combines information from many disciplines, such as biology (particularly ecology), geography, chemistry, geology, physics, economics, sociology (particularly demography, the study of populations), cultural anthropology, natural resources management, agriculture, engineering, law, politics, and ethics.

2 Environmental science encompasses² many complex and interconnected problems involving human population, Earth's natural resources, and environment pollution. Pollution is any alteration of air, water, or soil that harms the health, survival, or activities of humans and other living organisms.

Environmental Sustainability

3 One of the most important and most frequently used terms in environmental science is environmental sustainability. Broadly speaking, environmental sustainability is the ability of the environment to function indefinitely without going into a decline from the stresses imposed by human society on natural systems (such as soil, water, and air) that maintain life. When the environment is used sustainably, humanity's present needs are met without endangering the welfare of future generations. Environmental sustainability applies at many levels, including community, regional, national, and global levels.

1. **organism** (ôr'gô-niz'äm) *n.* A living thing, such as a plant or animal.
 2. **encompass** (ĕn-küm'pôs) *v.* To include; surround.

Chapter 4: Leaving Footprints-Nature's Memory

بيئتنا المتغيرة

العلوم البيئية

كيف يمكن للإنسان أن يعيش بأفضل ضمن بيئته الأرض والذى هو موضوع ما يسمى فضفاضاً بالعلوم البيئية العلوم البيئية، ودراسة المتعددة التخصصات من العلاقة الإنسانية مع الكائنات الحية الأخرى والبيئة الطبيعية غير الحية. علم البيئة هو متعدد التخصصات لأنه يستخدم ويجمع المعلومات من العديد من التخصصات، مثل علم الأحياء (البيئة على وجه الخصوص)، والجغرافيا، والكيمياء، والجيولوجيا، والفيزياء والاقتصاد والاجتماع (خاصة الديموغرافية، دراسة السكان) وعلم الإنسان الثقافي، وإدارة الموارد الطبيعية، الزراعة والهندسة والقانون والسياسة والأخلاق.

العلوم البيئية تشمل العديد من المشاكل المعقّدة والمترابطة التي تشمل سكان البشرية والموارد الطبيعية للأرض، وتلوث البيئة. التلوث هو أي تغيير في الماء والهواء أو التربة التي تضر الصحة، والبقاء على قيد الحياة، أو أنشطة البشر و الكائنات الحية الأخرى.

الحفاظ على البيئة

واحدة من أهم المصطلحات والأكثر استخداماً في مجال العلوم البيئية والاستدامة البيئية. التحدث بشكل عام، الحفاظ على البيئة هو قدرة البيئة على العمل لأجل غير مسمى دون الدخول في تراجع من الضغوط التي يفرضها المجتمع البشري على النظم الطبيعية (مثل التربة والماء، والهواء) التي تحافظ على الحياة. عندما يتم استخدام بيئته مستدامة، وتلبية الاحتياجات الإنسانية الحالية دون تعريض رفاهية الأجيال المقبلة.

الاستدامة البيئية تتطبق على العديد من المستويات، بما في ذلك المجتمع المحلي، والإقليمي والوطني، وعلى المستوى العالمي.

4 Many experts in environmental science think that human society is not operating sustainably because of the following human behaviors:

1. We are using non-renewable resources such as fossil fuels³ as if they were present in unlimited supplies.
2. We are using renewable resources such as fresh water faster than they can be replenished⁴ naturally.
3. We are polluting the environment with toxins as if the capacity of the environment to absorb⁵ them were limitless.
4. Our population continues to grow despite the Earth's finite ability to support us.

5 If left unchecked, these activities may reach the point of environmental catastrophe,⁶ threatening the life-support systems of the Earth to the extent that recovery is impossible.

6 At first glance, the issues may seem simple. Why don't we just stop the over-consumption, population growth, and pollution? These solutions are more complex than they may initially seem, in part because of various interactions among ecological, social, cultural, and economic factors. Our inadequate understanding of how the complex, dynamic environment "works" and how different human choices affect the environment is a major reason that problems of environmental sustainability are difficult to resolve. Because of the effects of many interactions between the environment and humans are unknown or difficult to predict, we generally do not know if corrective actions should be taken before—or after—our scientific understanding is complete.

7 The key challenge, then, is to meet immediate human needs while protecting the environment for the long term. We try to present a balanced evaluation of the many causes of environmental problems. We also provide the scientific foundation to evaluate these problems, and we suggest various courses of action based on our current understanding of the environment.

Raven, P. H., & Berg, L. R. (2001). *Environment* (3rd ed.)(pp. 5–6). Hoboken, NJ: John Wiley & Sons.

3. **fossil fuel** (fôs'äl fyoo'äl) *n.* Material left of or by a plant or animal that lived long ago that burns, such as natural gas, petroleum, and coal.
4. **replenish** (ri-plen'ish) *tr.v.* To restore a supply of something.
5. **absorb** (âb-sôrb') *v.* To soak up or take in.
6. **catastrophe** (kâ-tas'trô-fë) *n.* A great, often sudden, disaster.

العديد من الخبراء في العلوم البيئية يعتقدون أن المجتمع البشري لا يعمل بطريقة مستدامة بسبب السلوكات البشرية التالية:

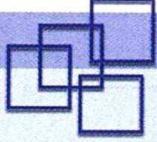
1. نحن نستخدم الموارد غير المتتجددة مثل الوقود الأحفوري كما لو أنها كانت موجودة في امدادات غير محدودة.
2. نحن نستخدم الموارد المتتجددة مثل المياه العذبة بشكل أسرع مما يمكن تغذيته بشكل طبيعي.
3. نحن نلوث البيئة مع المواد السامة وكان قدرة البيئة على استيعابها غير محدودة.
4. سكّاننا في ازدياد مستمر على الرغم من القدرة المحدودة للأرض لدعنا.

إذا تركت دون ضوابط، هذه الأنشطة قد تصل إلى حد الكارثة البيئية، التي تهدّد نظم دعم الحياة على سطح الأرض إلى الحد الذي لا يمكن استرداده. للوهلة الأولى، قد تبدو بسيطة القضايا. لماذا لا يتم فقط وقف الإفراط في الاستهلاك والنمو السكاني، والتلوّث؟

هذه الحلول هي أكثر تعقيداً مما قد تبدو في البداية، وذلك جزئياً بسبب التفاعلات المختلفة بين الإيكولوجية، والعوامل الاجتماعية والثقافية والاقتصادية. إن فهمنا غير كافي لكيفية التعقيد، البيئة الديناميكية "العمل" وكيفية أن اختيارات الإنسان المختلفة تؤثر على البيئة هي الأسباب الرئيسية التي جعلت من مشاكل الاستدامة البيئية يصعب حلها.

يسبب الآثار المترتبة على كثير من التفاعلات بين البيئة والبشر غير معروفة، أو يصعب التنبؤ بها، ونحن عموماً لا نعرف ما إذا كان ينبغي أن تؤخذ الإجراءات التصحيحية قبل أو بعد اكتمال الفهم العلمي لدينا.

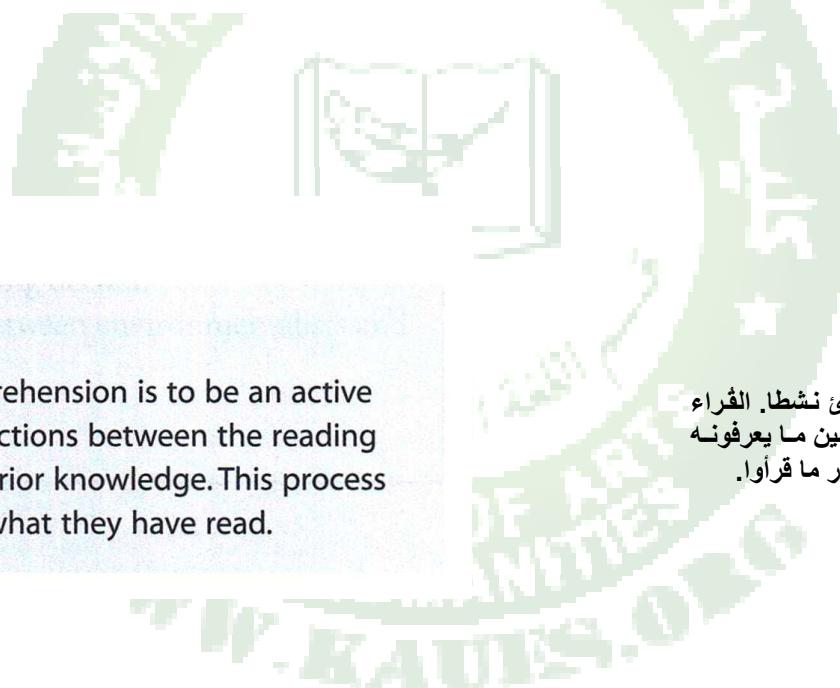
التحدي الأساسي، إذن، هو لتلبية الاحتياجات الإنسانية الفورية مع المحافظة على البيئة على المدى الطويل. ونحن نحاول تقديم تقييم متوازن لأسباب كثيرة من المشكلات البيئية. كما نقوم بتوفير الأساس العلمي لتقييم هذه المشاكل، ونحن نقترح مسارات العمل المختلفة على أساس فهمنا الحالي للبيئة.



STRATEGY

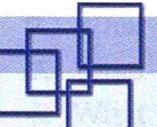
Reading Strategy

The base form of a word is called the root word or headword. Word families can be built from each headword by adding affixes to the word. A prefix comes *before* the headword, and a suffix comes *at the end of* a headword. Usually, one form of a word is more common and familiar than other forms. Knowing different word forms can enrich your vocabulary.



استراتيجية القراءة

يسمى النموذج الأساسي للكلمة بكلمة الجذر أو المعجم. ويمكن بناء عائلات الكلمة لكل معجم بإضافة اللاحقات للكلمة. البداءة تأتي قبل المعجم، واللاحقة تأتي في نهاية المعجم. عادةً، نموذج واحد من الكلمة هو الأكثر شيوعاً وألطف من النماذج الأخرى. معرفة نماذج مختلفة للكلمة يمكن أن تثري مفرداتك.



STRATEGY

Reading Actively

One way to improve your reading comprehension is to be an active reader. Active readers try to make connections between the reading text and what they already know, their prior knowledge. This process helps them understand and remember what they have read.

القراءة بنشاط

طريقة واحدة لتحسين فهم القراءة لديك هو أن يكون القراء نشطاً. القراء النشطون يحاولون لإجراء اتصالات بين نص القراءة وبين ما يعرفونه بالفعل، معرفتهم السابقة. هذه العملية تساعدهم على فهم وتنكر ما قرأوا.



Reading Selection 2

OLD-GROWTH FORESTS OF THE PACIFIC NORTHWEST

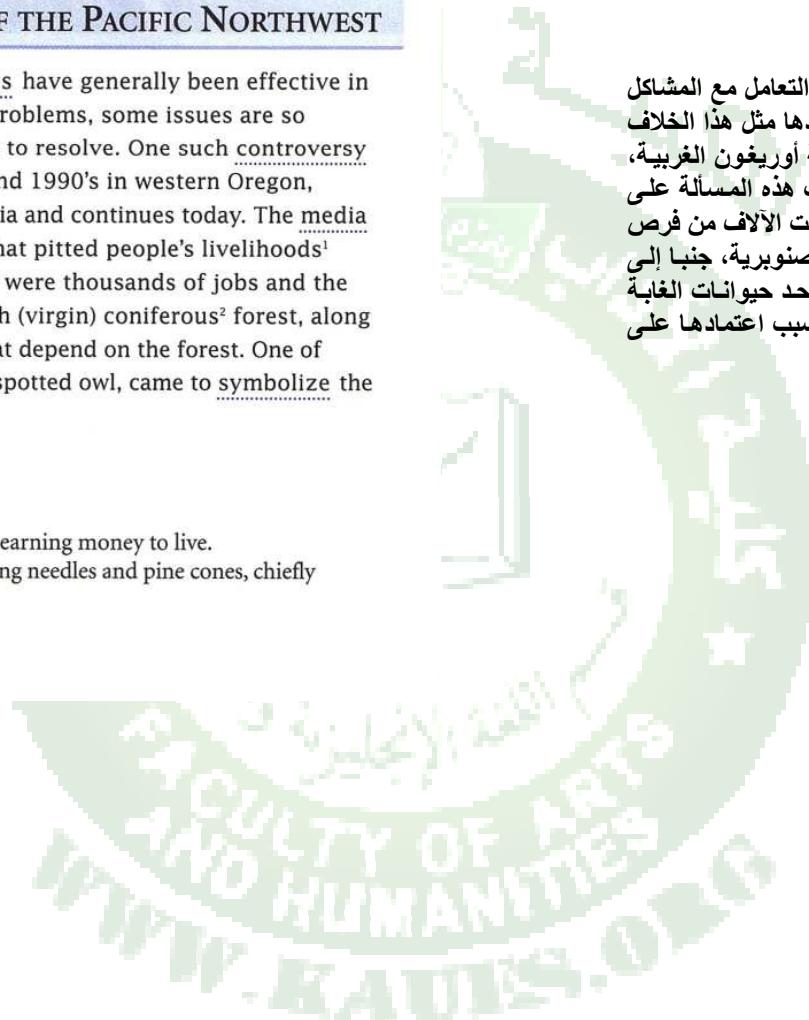
¹ Although legislative approaches have generally been effective in dealing with environmental problems, some issues are so contentious that they are difficult to resolve. One such controversy escalated during the late 1980's and 1990's in western Oregon, Washington, and northern California and continues today. The media portrayed this issue as a drama that pitted people's livelihoods¹ against the environment. At stake were thousands of jobs and the future of large tracts of old-growth (virgin) coniferous² forest, along with the existence of organisms that depend on the forest. One of these forest animals, the northern spotted owl, came to symbolize the

Old-growth forests are found along the Pacific coast of the United States from Alaska to Northern California.

1. **live•li•hood** (līv'lē-hōōd') *n.* Ways of earning money to live.
2. **co•nif•er•ous** (kō-nīf'ər-əs) *adj.* Having needles and pine cones, chiefly evergreen.

الغابات المعمرة في شمال غرب الباسيفيك

على الرغم من أن النهج التشريعية كانت عموماً فعالة في التعامل مع المشاكل البيئية، بعض القضايا المتيرة للجدل التي يصعب حلها. أحد هذه مثل هذا الخلاف المتصاعد في أواخر عام 1980 وعام 1990 في ولاية أوريغون الغربية، واشنطن، وكاليفورنيا الشمالية وستمر حتى اليوم. صورت هذه المسألة على الدراما التي تدور معيشة الناس ضد البيئة. على المحك كانت الآلاف من فرص العمل ومستقبل أجزاء كبيرة معمرة (العذراء) الغابات الصنوبرية، جنباً إلى جنب مع وجود الكائنات الحية التي تعتمد على الغابات. أحد حيوانات الغابة هذه (البومة الشمالية المرقطة) أتت لتمثل المواجهة بسبب اعتمادها على الغابات الناضجة للموطن.



confrontation because of its dependence on mature forest for habitat.³ These birds are species that usually need large areas of intact forest to supply them with food such as flying squirrels and red tree voles (a mouse-like animal). The northern spotted owl is currently listed as a threatened species under the Endangered Species Act.⁴

The Environmental Significance of Old-Growth Forests

- 2 Old-growth forests, by definition, have never been logged. They are very different from forests that were logged and have re-grown. For one thing, many of the redwoods and sequoias in old-growth forests are ancient—some as old as 2000 years. Many trees have attained immense sizes. Some Douglas firs, for example are 91 m (300 ft) tall and 4.9 m (16 ft) in diameter. Old-growth forests usually contain trees of the same age and size.
- 3 Because most of the forests in the United States have been logged at one time or another, the amount of old-growth forest represents a small fraction of the total forested area in the United States. This fraction is decreasing because old-growth forests in the United States are found only in the Pacific Northwest and Alaska.
- 4 Biologists regard the remaining old-growth forest of Douglas fir, coastal redwoods, sequoias, and spruce in the Pacific Northwest as living laboratories. These forests demonstrate the complexity of a natural ecosystem⁵ that has not been extensively altered by humans. When one of the ancient trees dies, for example, it eventually crashes to the ground, felling other trees in its path. This provides an open area in the forest canopy.⁶ Sunlight penetrates the ground floor, and plants grow in profusion,

3. **hab•i•tat** (hăb'ē-tăt') *n.* The area or natural environment in which an animal or a plant normally lives or grows.
4. **En•dan•gered Spe•cies Act** 1973 law that requires the government to protect a plant or an animal whose population is so low that it is in danger of becoming extinct.
5. **e•co•sys•tem** (ē'kō-sĭs'tĕm) *n.* The community of a certain area that includes the plants, animals, microorganisms, and physical environment.
6. **can•o•py** (kăn'ə-pĕ) *n.* The uppermost layer in a forest, formed by the upper branches of the trees.

هذه الطيور هي من الأنواع التي تحتاج في العادة مساحات كبيرة من الغابات السليمة لتزودهم بالطعام مثل السنابج الطائرة وفران الشجر الحمراء (حيوان يشبه الفار). يتم سرد اليومة الشمالية المرقطة حاليا باعتبارها من الأنواع المهددة بالانقراض بموجب قانون حماية الأنواع المعرضة للانقراض.

الأهمية البيئية للغابات المعمرة

الغابات المعمرة، بحكم تعريفها، لم يتم تسجيلها. فهي مختلفة جدا من الغابات التي تم تسجيلها و إعادة زراعتها. لشيء واحد وهو، أن العديد من أشجار الخشب الأحمر والسيكوييا في الغابات المعمرة هي قديمة والبعض منها يقارب عمرها ٢٠٠٠ سنة. قد بلغت العديد من الأشجار أحجام هائلة. كدوغلاس التنوب، على سبيل المثال إلى ٩١ مترا (٣٠٠ قدم) و طوله ٤,٩ مترا (١٦ قدم) في القطر. الغابات المعمرة تحتوي عادة على أشجار من نفس العمر والحجم.

لأنه قد تم تسجيل أكثر الغابات في الولايات المتحدة في وقت واحد أو آخر، كمية الغابات المعمرة يمثل جزءا صغيرا من إجمالي مساحة الغابات في الولايات المتحدة. هذا جزء آخر في التناقض بسبب العثور على الغابات المعمرة في الولايات المتحدة فقط في شمال غرب المحيط الهادئ وألاسكا.

علماء البيولوجيا يعتبرون ما تبقى من غابات دوغلاس التنوب، أشجار الخشب الأحمر الساحلية، والسيكوييا، وشجرة التنوب في شمال غرب المحيط الهادئ المعمرة كمعامل حية. هذه الغابات تثبت تعقيد النظام البيئي الطبيعي والتي لم يتم تغييرها على نطاق واسع من قبل البشر. عندما تموت واحدة من الأشجار القديمة ، على سبيل المثال، إنه في نهاية المطاف تتحط على الأرض، وتقطع الأشجار الأخرى في طريقها. وهذا يوفر منطقة مفتوحة في مظلة الغابات. أشعة الشمس تتغلغل إلى الطابق الأرضي، والنباتات تنمو بوفرة،

providing food for many forest animals. The fallen tree also provides habitat for many organisms. Voles, for example, live in crevices⁷ provided by the rotting log. Voles are an essential part of the forest because they feed on certain fungi. Undigested fungal spores⁸ are spread throughout the forest in vole droppings.⁹ These fungi form associations with tree roots and provide the trees with mineral nutrients released from the fallen tree as it decays.

5 To environmentalists, the old-growth forests are a national treasure to be protected and cherished. These stable forest ecosystems provide the primary biological habitats for many species, including the northern spotted owl and 40 other endangered or threatened species. Provisions of the Endangered Species Act require the government to protect the habitat of endangered species so that their numbers can increase. To enforce this law, in 1991 a court ordered the suspension of logging in about 1.2 million hectares of federal forest where the owl lives.

The Commercial Significance of Old-Growth Forests

6 The timber¹⁰ industry bitterly opposed the 1991 moratorium,¹¹ stating that thousands of jobs would be lost if the northern spotted owl habitat were to be set aside. Many rural communities in the Pacific Northwest did not have diversified economies; timber was their main source of revenue. Thus, a major confrontation over the future of the old-growth forest ensued between the timber industry and environmentalists. Strong feelings were expressed on both sides—witness the bumper sticker reading: "Save a logger, kill an owl."



Old-growth forest



Northern spotted owl

7. **crev•ic** (krēv'īs) *n.* Narrow cracks or openings.
8. **fun•gal spores** (fün'gäl spôrz) *n.* Small, usually single-celled reproductive bodies of a fungus (e.g., mushroom).
9. **drop•pings** (drōp'ingz) *n.* The waste matter from the bowels of animals.
10. **tim•ber** (tim'bər) *n.* The wood from trees before it has been processed into building materials.
11. **mor•a•to•ri•um** (môr'ə-tôr'ē-əm) *n.* A suspension or ban of some activity, preventing an action from taking place for a period of time.

توفير الغذاء للعديد من حيوانات الغابة. الشجر الساقط يوفر أيضاً مأوى لكثير من الكائنات الحية. كفران الحقل، على سبيل المثال، تعيش في الشقوق التي يقدمها السجل المتعفن. فران الحقل تشكل جزءاً أساسياً من الغابة لأنها تتغذى على فطريات معينة. وتنشر الجراثيم الفطرية غير المهمضومة في جميع أنحاء الغابات في فضلات فران الحقل. هذه الفطريات تشكل جمعيات مع جذور الأشجار وتتوفر للأشجار المواد المعدنية المغذية التي صدرت من شجرة ساقطة لأنها تحولت.

إلى خبراء البيئة، إن الغابات المعمرة هي ثروة وطنية يجب حمايتها والاعتزاز بها. هذه النظم الأيكولوجية المستقرة للغابات توفر المواطن البيولوجية الأساسية لكثير من الأنواع، بما في ذلك البومة الشمالية المرقطة و ٤٠ نوع آخر مهدد بالانقراض أو الأنواع المهددة بالانقراض. أحكام قانون المهددة بالانقراض يطلب من الحكومة حماية المواطن الطبيعية للأنواع المهددة بالانقراض بحيث يمكن أن تزيد من أعدادها. لتطبيق هذا القانون، في عام ١٩٩١ أمرت محكمة وقف قطع الأشجار في حوالي ١,٢ مليون هكتار من الغابات الاتحادية التي يعيش فيها البومة.

الأهمية التجارية للغابات المعمرة

صناعة الأخشاب تعارض بشدة الوقف عام ١٩٩١،¹² يذكر أنه سيتم فقدان الآلاف من فرص العمل إذا موطن البومة الشمالية المرقطة كان من المقرر أن توضع جانباً. كثير من المجتمعات الريفية في شمال غرب المحيط الهادئ لم يكن لديها اقتصادات متنوعة؛ الأخشاب كان المصدر الرئيسي للدخل. وبالتالي، نشبت مواجهة كبيرة حول مستقبل الغابات المعمرة بين صناعة الأخشاب وخبراء البيئة. وأعرب عن مشاعر قوية من كلا الجانبين يشهد ملصقات كتب عليها "احفظ المسجل، وقتل البومة".

Complexities of the Controversy that Were Seldom Portrayed by the Media

7 The situation was more complex than simply jobs versus the owl, however. The timber industry was already declining in terms of its ability to support people in the Pacific Northwest. During the decade between 1977 and 1987, logging in Oregon's national forests increased by over 15%, whereas employment dropped by 15%—an estimated 12,000 jobs—during the same period. The main cause of this decline was automation of the timber industry. In addition, the timber industry in that region had not been operating sustainably—that is, they removed trees faster than the forest could regenerate.¹² If the industry continued to log at their 1980's rates, most of the remaining old-growth forests would have disappeared within 20 years.

8 Timber is not as important to the economy of the Pacific Northwest as it used to be, a change that began long before the northern spotted owl controversy. States in the Pacific Northwest diversified, and by the late 1980's, the timber industry's share of the economy in Oregon and Washington was less than 4%. Although some had predicted economic disaster in 1991 when logging was blocked in the old-growth forest, Oregon's unemployment rate in 1994 was the lowest in 25 years. Oregon attracted several high-technology companies, which produced more jobs than had been lost from logging. (Interestingly, a 1994 analysis by the Institute for Southern Studies concluded that states that protect their natural resources and have good environmental records have the best long-term prospects for economic development. An important factor in Oregon's economic growth is its quality of life, which in turn, is a result of its forests and other natural resources.)

The Political Solution to the Controversy

9 In 1993, President Clinton convened a much-publicized timber summit in Portland, Oregon, with members from all sides of the issue. The 1994 Northwest Forest Plan that arose from this summit represented a compromise¹³ between environmental and timber interests. A federal judge approved the plan in December 1994.

12. **re•gen•er•ate** (rē-jēn'ə-rāt') *v.* To grow again, re-create.

13. **com•pro•mise** (kōm'prō-mīz) *n.* A settlement of an argument in which each side gives up some of what it wants.

تعقيدات الجدل الذي صورت نادراً من قبل وسائل الإعلام.

كان الوضع أكثر تعقيداً من مجرد وظيفة مقابلة، ولكن. كانت صناعة الخشب في انخفاض بالفعل من حيث قدرتها على دعم الناس في شمال غرب المحيط الهادئ. خلال العقد بين عامي ١٩٧٧ و ١٩٨٧، قطع الأشجار في غابات ولاية أوريغون الوطنية زاد بما يربو على ١٥٪، في حين انخفضت العمالة بنسبة ١٥٪ ما يقدر ب ١٢٠٠٠ وظيفة. خلال نفس الفترة. كانت السبب الرئيسي لهذا الانخفاض هي صناعة الأخشاب. وبالإضافة إلى ذلك، صناعة الأخشاب في تلك المنطقة لم تعمل على نحو مستدام، وأنهم يزيلون الأشجار أسرع من الغابات الممكن تجديدها. وأضاف "إذا وصلت هذه الصناعة التسجيل بتقديراتهم لعام ١٩٨٠ ، وكانت قد اختفت أكثر الغابات المعمرة المتبقية في غضون ٢٠ عاماً.

الأخشاب ليست مهمة بالنسبة لاقتصاد منطقة شمال غرب المحيط الهادئ كما كانت عليه من قبل، التغيير الذي بدأ قبل فترة طويلة من جدل البومه الشمالية المركبة. الدول في شمال غرب المحيط الهادئ متنوعة، وبحلول أواخر عام ١٩٨٠، كانت حصة صناعة الأخشاب من الاقتصاد في ولاية أوريغون وواشنطن أقل من ٤٪. على الرغم من أن البعض كان قد توقع كارثة اقتصادية في عام ١٩٩١ عندما تم حظر قطع الأشجار في الغابات المعمرة، كان معدل البطالة في ولاية أوريغون في عام ١٩٩٤ في أدنى مستوى له من ٢٥ عاماً. جذبت ولاية أوريغون العديد من شركات التكنولوجيا العالية، والتي تنتج المزيد من فرص العمل لمن كان قد خسر عمله من قطع الأشجار. (المثير للاهتمام، خلص تحليل للعام ١٩٩٤ من قبل معهد الدراسات الجنوبية تنص على حماية مواردها الطبيعية ولديها سجلات بيئية جيدة وتكون لديها أفضل الفرص للتنمية الاقتصادية على المدى البعيد. ثمة عامل مهم في نمو أوريغون الاقتصادية هو نوعية الحياة فيها، والتي في المقابل، هو نتيجة للغابات والموارد الطبيعية الأخرى).

الحل السياسي للجدل

في عام ١٩٩٣، عقد الرئيس كلينتون قمة الأخشاب الكثيرة الداعية في بورتلاند بولاية أوريغون، مع أعضاء من كل جوانب القضية. خطة الغابات الشمالية الغربية لعام ١٩٩٤ التي نشأت عن هذه القمة مثلت حل وسطاً "بين الاهتمامات البيئية والأخشاب. وافق على الخطة قاض فيدرالي في ديسمبر ١٩٩٤.

10 Thanks to a healthy infusion of federal aid to the area, some timber workers were retrained for other kinds of careers. State programs, such as the "Jobs for the Environment" project funded by the state of Washington, also helped reduce unemployment. Hundreds of former loggers were employed by "Jobs for the Environment" and similar programs to restore watersheds¹⁴ and salmon habitat in the forests they used to harvest.

11 As a result of the Northwest Forest Plan, logging was resumed on federal forests of Washington, Oregon, and northern California. However, only about one fifth of the logging that occurred during the 1980's was permitted. The plan, along with previous congressional and administrative action, reserved about 75% of federal timber lands to safeguard watersheds and provide protection for the northern spotted owl and other species, including salmon and other fishes.

12 As happens with many compromises, neither environmentalists nor timber-cutting interests were happy with the Northwest Forest Plan. Some environmentalists did not think the plan was scientifically sound and worried that it took too many risks with conservation values. Timber-cutting interests challenged the legality of the plan and tried to revoke¹⁵ or revise the laws that restricted logging. They proposed turning over a significant area of federal timberlands to local counties, where timber interests have more political clout.¹⁶ They also asked Congress to pass legislation allowing a greater harvest of timber because of the economic hardship.

13 Responding to powerful timber interests, a controversial bill that permitted salvage logging¹⁷ in national forests was signed into law in 1995. The law allowed loggers to cut dead trees and trees weakened by insects, disease, or fire, as well as "associated trees," healthy trees considered to be in danger of catching a disease. The law, which expired at the end of 1996, allowed loggers access to parts of the forest that had been declared off-limits by the Northwest Forest Plan as well as other national forest areas not normally open to logging. It also exempted timber companies from complying with provisions of the Clean Water Act and Endangered Species Act.

14. **wa•ter•shed** (wô'tär-shĕd') *n.* Mountains or other high places whose water drains into a river, river system, or other body of water.

15. **re•voke** (rë-vôk') *v.* To make something void by reversing, recalling, or withdrawing; cancel.

16. **po•lit•i•cal clout** (pë-lët'ë-käl-klout) *n.* The power and influence of a government or politician.

17. **sal•vage log•gin•g** (säl'vij lô'gëng) *n.* Logging the damaged trees.

ذلك بفضل الحقن الصحي للمعونات الاتحادية إلى المنطقة، وإعادة تدريب بعض عمال الأخشاب لأنواع أخرى من المهن. البرامج الحكومية، مثل "وظائف البيئة" الذي تموله ولاية واشنطن، وساعد أيضاً الحد من البطالة.

تم توظيف المئات من قاطعي الأشجار السابقين من قبل "وظائف البيئة"، وبرامج مماثلة لاستعادة تجمعات المياه "ومسكن السلمون في الغابات" التي استخدموها لموسم الحصاد.

نتيجة لخطة الغابات الشمالية الغربية، تم استئناف قطع الأشجار في الغابات الاتحادية لواشنطن، أوريغون، وشمال ولاية كاليفورنيا.

ومع ذلك، سمح ل حوالي الخمس من قطع الأشجار التي حدثت خلال عام ١٩٨٠. هذه الخطة، جنباً إلى جنب مع الإجراءات السابقة في الكونغرس والإدارة، محفوظة بنحو ٧٥٪ من أراضي الأخشاب الاتحادية لحماية مستجمعات المياه وتوفير الحماية لللبومنة الشمالية المرقطة وغيرها من الأنواع، بما في ذلك السلمون وأسماك أخرى. كما هو حاصل مع تنازلات

كثيرة، لم يكونوا خبراء البيئة ولا قاطعي الأخشاب ، راضين عن خطة الغابات الشمالية الغربية. لم يكن لبعض خبراء البيئة اعتقاد أن الخطة كانت سليمة من الناحية العلمية وكانوا قلقين أن الأمر استغرق الكثير من المخاطر مع الحفاظ على القيم. تحدي رغبات قاطعي الأخشاب الشرعية لخطة وحاولوا إلغاء أو تعديل القوانين المقيدة لقطع الأشجار. واقترحوا التحول على مساحة كبيرة من المشاجر الفدرالية إلى المقاطعات المحلية، حيث رغبات قاطعي الأخشاب لديها المزيد من النفوذ السياسي. طلبو من الكونغرس تمرير التشريعات بالسماح لأكبر محصول من الخشب بسبب الصعوبات الاقتصادية.

ورداً على رغبات قاطعي الأخشاب القوية، مشروع القانون المثير للجدل الذي يسمح بإنقاذ قطع الأشجار في الغابات الوطنية تم توقيعه في القانون في عام ١٩٩٥. وسمح القانون لقاطعي الأشجار بقطع الأشجار الميتة والأشجار الضعيفة بفعل الحشرات، والأمراض، أو الحرائق، فضلاً عن "الأشجار ذات الصلة"، الأشجار الصحية تعتبر في خطر الاصابة بالمرض.

القانون، والذي انتهى في نهاية عام ١٩٩٦، قاطعي الأشجار المسموح لهم بالوصول إلى أجزاء من الغابات التي كانت قد أعلنت بأنها منطقة محظورة من قبل خطة الغابات الشمالية الغربية، فضلاً عن غيرها من مناطق الغابات الوطنية ليست مفتوحة عادة لقطع الأشجار. أنها معفاة أيضاً لشركات الأخشاب من الامتثال لأحكام قانون المياه النظيفة وقانون الأنواع المهددة بالانقراض.

14 Forestry scientists and environmentalists opposed the salvage logging law because dead and diseased trees have important ecological roles in forests. Taxpayer advocates, such as the National Taxpayers Union, opposed the law because it costs taxpayers money. The U.S. Forest Service annually spends millions of dollars more to harvest trees in national forests than it earns from the timber sales. In 1994, for example, the federal government spent \$100 million to build and maintain roads through national forests; timber companies haul lumber on these roads. Taxpayer advocates¹⁸ consider road construction in national forests a subsidy to the timber industry because it did not pay for any of the road construction or repair costs. In 1999 a federal judge ruled the U.S. Forest Service and Bureau of Land Management, the two government agencies overseeing logging of old-growth forests on federal land, had not adequately carried out the provisions of the 1994 Northwest Forest Plan. Specifically, the Northwest Forest Plan had required that the federal agencies complete extensive surveys of 77 local endangered and threatened species before granting the timber industry permission to log. The judge agreed with the 13 environmental groups that brought the suit against the federal agencies that the agencies had failed to complete the surveys. This ruling triggered a new round of bitter legal battles between timber interests and environmentalists in the Pacific Northwest.

An Economic Case for Preserving Old-Growth Forests

15 According to environmental economists, the old-growth forests that remain should not be logged because a cost-benefit analysis indicated the resulting loss to society is too great. Not only do taxpayers subsidize the timber industry, but the financial benefits associated with preserving these forests (such as protection of species and increased recreation) also outweigh the cost of preservation (such as loss of logging jobs and an increased price of wood). There are so few intact old-growth forests that the cost of losing even a single stand¹⁹ is unacceptably high. The public is therefore willing to pay a great deal to preserve any remaining old-growth forests.

Raven, P. H., & Berg, L. R. (2001). *Environment* (3rd ed.)(pp. 54–57). Hoboken, NJ: John Wiley & Sons.

18. **tax•pay•er ad•vo•cate** (tăks'pă'ər ăd've-kăt) *n.* Someone who supports or works for taxpayers.

19. **stand** (stănd) *n.* A group or growth of tall plants or trees.

عارض علماء الغابات وخبراء البيئة قانون الإنقاذ من قطع الأشجار لأن الأشجار الميتة والمريضة لها أدوار إيكولوجية هامة في الغابات. يعارض المدافعين عن دافعي الضرائب، مثل الاتحاد الوطني لدافعي الضرائب القاتل، لأنه يكلف دافعي الضرائب الأموال. دائرة الغابات في الولايات المتحدة تتفق سنويًا الملايين من الدولارات لحصد مزيد من الأشجار في الغابات الوطنية أكثر مما ينتج عن مبيعات قاطعي الأخشاب. في عام 1994، على سبيل المثال، أنفقت الحكومة الفيدرالية 100 مليون دولار لبناء وصيانة الطرق عبر الغابات الوطنية؛ شركات الأخشاب أبعدت الخشب على هذه الطرق. المدافعين عن دافعي الضرائب ينظرون إعانة تشييد الطرق في الغابات الوطنية لصناعة الأخشاب لأنه لم يدفع لأي من بناء الطرق أو تكاليف التصليح. في عام 1999 حكم القاضي الفيدرالي خدمة الغابات ومكتب إدارة الأراضي في الولايات المتحدة، وكذلك حكومتين تشرف على قطع الأشجار من الغابات المعمرة في الأراضي الاتحادية، لم تجر على نحو كافٍ من أحكام خطة 1994 للغابات الشمالية الغربية. على وجه التحديد، طلبت خطة غابة الشمالية الغربية أن تكمل الوكالات الفيدرالية عمليات المسح المكثفة لـ 77 نوع المعرض للخطر والأنواع المهددة المحلية قبل منح إذن صناعة الأخشاب للدخول. وافق القاضي مع الجماعات البيئية التي جلبت 13 دعوى ضد الوكالات الفيدرالية أن الوكالات قد فشلت لاستكمال الدراسات الاستقصائية. أثار هذا الحكم جولة جديدة من المعارك القانونية المريضة بين مصالح الأخشاب وخبراء البيئة في شمال غرب المحيط الهادئ.

الحالة الاقتصادية للمحافظة على الغابات المعمرة.

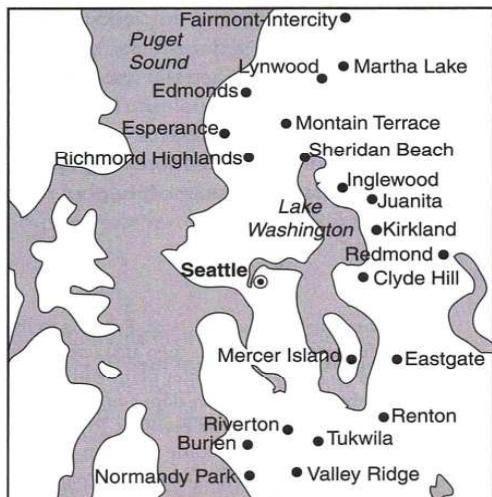
وفقاً لخبراء الاقتصاد البيئي، أن الغابات المعمرة التي لا تزال، لا ينبغي أن يتم تسجيلها لأن تحليل التكاليف والفوائد أشارت أن الخسارة الناتجة للمجتمع كبيرة جدًا. ليس فقط دافعي الضرائب في دعم صناعة الأخشاب، إلا أن الفوائد المالية ذات الصلة مع الحفاظ على هذه الغابات (مثل حماية الأنواع والاستخدام المتزايد) تفوق أيضًا تكلفة المحافظة (مثل فقدان وظائف قطع الأشجار والثمن المتزايد للخشب) وهناك عدد قليل جداً من الغابات المعمرة السليمة التي تكلف كثيراً حتى الشجر الواقع بمفرده مرتفع بشكل غير مقبول. الجمهور هو وبالتالي على استعداد لدفع الكثير من أجل الحفاظ على أي مما تبقى من الغابات المعمرة.

استراتيجية : التخطيط العملي
 الكثير من الأوقات يكون لكتب العلوم المدرسية وصفاً لعمليات معقدة. فمن السهل أن نفهم ونتقدير هذه العمليات إذا قمت بإجراء رسم تخطيطي للعملية.

Reading Selection 3

ENVIRONMENTALISTS AT WORK—CASE IN POINT:
LAKE WASHINGTON

1 Just as generals study old battles in order to learn how battlefield decisions are made, we can study an environmental battle that was successfully waged in the 1950's to learn how environmental problems are solved. The battle was fought over the pollution of Lake Washington, a large, (86 km² or 33.2 mi²), deep freshwater lake forming the eastern boundary of the city of Seattle. During the first part of the 20th century, the Seattle metropolitan area expanded eastward toward the lake from the shores of Puget Sound, an inlet of the Pacific Ocean. As this expansion occurred, Lake Washington came under increasingly intense environmental pressures. Recreational use of the lake expanded greatly, and so did its use for waste disposal. Sewage¹ arrangements in particular had a major impact on the lake.



1. **sew·age** (sōō'ij) *n.* Liquid and solid waste from toilets that is carried away in sewers or drains.

STRATEGY

Diagramming a Process

Many times science textbooks have descriptions of complex processes. It is easier to understand and remember these processes if you make a diagram of the process.

دعاة حماية البيئة في القضية العمل على ذلك:

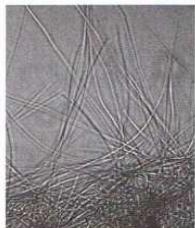
بحيرة واشنطن

تماماً كما يدرس الجنرالات المعارك القديمة من أجل معرفة كيفية اتخاذ القرارات في ساحة المعركة، نستطيع دراسة المعركة البيئية التي تم شنها بنجاح في عام ١٩٥٠ لمعرفة كيف يتم حل المشاكل البيئية. المعركة تم خوضها خلال تلوث بحيرة واشنطن الكبيرة، (٦٨ كم² أو ٣٣,٢ ميل²)، بحيرة العذبة العميقة تشكل الحدود الشرقية لمدينة سياتل. خلال الجزء الأول من القرن ٢٠، وسعت منطقة مدينة سياتل شرقاً باتجاه بحيرة من شواطئ بحيرة ساوند، وهو مدخل للمحيط الهادئ. كما حدث هذا التوسيع، جاءت بحيرة واشنطن في ظل الضغوط البيئية الشديدة على نحو متزايد. توسيع استعمالها للبحيرة لأغراض الترفيه بشكل كبير، ولقد فعل هذا استخدامها للتخلص من النفايات. كانت لترتيبات الصرف الصحي "على وجه الخصوص تأثير كبير على البحيرة.

Birth of an Environmental Problem

2 Like many U.S. cities, Seattle is surrounded by suburbs, each with individual municipal governments. These suburbs expanded rapidly in the 1940's, generating an enormous waste disposal problem. Between 1941 and 1954, ten suburban sewage treatment plants began operating at points around the lake, with a combined daily discharge of 75.7 million ltr (20 million gal) into Lake Washington. Each plant treated the raw sewage to break down the organic² material within it and released the effluent—that is, treated sewage—into the lake. By the mid-1950's, a great deal of treated sewage had been poured into the lake. Try multiplying 75.7 million ltr per day by 365 days per year by 5 to 10 years: Enough effluent was dumped to give about 25 to 50 ltr (6.5 to 13 gal) of it to every man, woman, and child living today.

3 Gabriel Comita and George Anderson, doctoral students at the University of Washington in Seattle, were the first to note the effects of this discharge on the lake. Their studies of the lake's microscopic organisms in 1950 indicated that large masses of *oscillatoria*, a filamentous³ cyanobacterium, or blue-green alga,⁴ were growing in the lake. The abundance⁵ of these long strings of photosynthetic bacterial⁶ cells in Lake Washington was unexpected. The growth of such large numbers of cyanobacteria requires a plentiful supply of nutrients, and deepwater lakes such as Lake Washington do not usually have enough dissolved nutrients to support cyanobacterial growth. Deepwater lakes are particularly poor in the essential nutrient phosphorus.⁷ The amount of filamentous cyanobacteria in Lake Washington's waters hinted that the lake was somehow changing, becoming richer in dissolved nutrients such as phosphorus.



Oscillatoria

2. **or•gan•ic** (ôr-gän'îk) *adj.* Relating to living things.
3. **fil•a•men•tous** (fil'ë-mĕn'ës) *adj.* Consisting of a thin, thread-like substance.
4. **al•ga** (äl'gô) *n.* A water plant with a simple structure.
5. **abun•dance** (ä-büñ'dans) *adj.* A great amount or quantity.
6. **bac•te•ri•al** (bäk tr'ë-äl) *adj.* Relating to any of a large group of very small one-celled organisms, some of which cause disease.
7. **phos•pho•rus** (fôs'fär-ôs) *n.* A yellowish chemical that is an essential part of living cells and that can be used in making fertilizers.

ميلاد المشكلة البيئية

مثل العديد من مدن الولايات المتحدة، تحاط مدينة سياتل بواسطة الضواحي، مع كل الحكومات البلدية الفردية. توسيع هذه الضواحي بسرعة في ١٩٤٠، مما يولد مشكلة التخلص من النفايات الهائلة. بين ١٩٤١ و ١٩٥٤، بدأ ١٠ محطات لمعالجة مياه الصرف الصحي في الضواحي بالعمل في نقاط حول البحيرة، مع تصريف يومي مجتمع لـ ٧٥٧٠٠٠٠ لتر (٢٠ مليون غالون) في بحيرة واشنطن. تعامل كل محطة لمياه الصرف الصحي إلى كسر المواد العضوية في داخلها، والإفراج عن النفايات السائلة، وهذا هو، ومعالجتها لمياه الصرف الصحي في البحيرة. وبحلول منتصف عام ١٩٥٠، كان قد صب على قدر كبير من مياه الصرف الصحي المعالجة في البحيرة. محاولة ضرب ٧٥٧٠٠٠٠ لتر في اليوم الواحد بواسطة ٣٦٥ يوما سنويا بنسبة ٥ إلى ١٠ سنوات: تم تفريغ النفايات السائلة بما يكفي لإعطاء حوالي ٥٠ لتر (٦٠،٥ حتى ١٣ غالون) منه إلى كل رجل وامرأة وطفل يعيش الآن.

كان كوميتا جبريل وأندرسون جورج وطلاب الدكتوراه في جامعة واشنطن في سياتل، أول من لاحظ آثار هذا التفريغ على البحيرة. وأشارت الدراسات الخاصة بهم للكائنات الحية المجهرية في البحيرة في عام ١٩٥٠ أن جماهير كبيرة من **oscillatoria**، وهي البكتيريا الزرقاء الخطيئة، أو الطحالب الخضراء المزرقة، التي كانت تنمو في البحيرة. وكانت الوفرة من هذه السلالس الطويلة من الخلايا البكتيرية الضوئية في بحيرة واشنطن غير متوقعة.

نمو هذه الأعداد الكبيرة من البكتيريا الزرقاء يتطلب امدادات وفيرة من المواد الغذائية، وليس ببحيرات المياه العميقة مثل بحيرة واشنطن عادة ما يكفي من المواد الغذائية قد حللت لدعم النمو السينانويكتيريا. بحيرات المياه العميقة هي فقيرة خاصة في الفوسفور والمواد الغذائية الأساسية. كمية البكتيريا الزرقاء الخطيئة في مياه بحيرة واشنطن لمحث أن البحيرة كانت تتغير بطريقة ما، لتصبح أكثر ثراء في العناصر الغذائية الذائبة مثل الفوسفور.

Sounding the Alarm

4 In July 1955, a technical report by the Washington Pollution Control Commission sounded one of the first public alarms. Citing the work of Comita and Anderson, it concluded that the treated sewage effluent that was being released into the lake's waters was raising the lake's levels of dissolved nutrients to the point of serious pollution. Whereas primary treatment, followed by chlorination,⁸ was ridding it of bacteria, it was not eliminating many chemicals, particularly phosphorus, a major component of detergents. In essence, the treated sewage was fertilizing the lake by enriching it with dissolved nutrients.

5 The process of nutrient enrichment of freshwater lakes is well understood by ecologists, who call it eutrophication. Eutrophication is undesirable because, as Comita and Anderson had already begun to observe, high nutrient levels contribute to the growth of filamentous cyanobacteria. These photosynthetic organisms need only three things in order to grow: light for photosynthesis,⁹ which they get from the sun; carbon atoms, which they get from carbon dioxide dissolved in water; and nutrients such as nitrogen and phosphorus, which were provided by the treated sewage. Without the nutrients, cyanobacteria cannot grow; supply the nutrients, and soon mats of cyanobacteria form a green scum¹⁰ on the surface of the water, and the water begins to stink from the odor of rotting organic matter.

6 Then the serious problem begins: the deep-water bacteria that decompose the masses of dead cyanobacteria multiply explosively, consuming vast quantities of oxygen in the process, until the lake's deeper waters become so depleted that they can no longer support other organisms that require oxygen to live. Fish can no longer extract enough oxygen through their gills, and neither can the myriad¹¹ of tiny invertebrates¹² that populate freshwater lakes.

8. **chlorination** (klôr'ə-nä'shən) *n.* The addition of chlorine.

9. **photoynthesis** (fô'to-sîn'thî-sîs) *n.* The chemical process by which plants use light to change water and carbon dioxide into food.

10. **scum** (skûm) *n.* A filmy layer of impure matter that forms on the surface of a liquid or a body of water.

11. **myriad** (mîr'ē-äd) *n.* A very large, indefinite number.

12. **invertebrate** (in-vûr'tä-brît) *n.* Animal, such as insects or worms, without a backbone.

الإنذار بالخطر

في يوليو ١٩٥٥، تقرير فني من قبل لجنة مكافحة التلوث بواشنطن أطلق واحدة من أجهزة الإنذار الأولى للجمهور. نقلًا عن عمل كوميتا وأندرسون، خلصت إلى أن مياه الصرف الصحي المعالجة التي تم إطلاقها في مياه البحيرة رفعت مستوى البحيرة من المغذيات الذائبة إلى درجة تلوث خطير. في حين أن المعالجة الأولية، تليها المعالجة بالكلور، "تم تخلصها من البكتيريا، ولكن لم يتم القضاء على الكثير من المواد الكيميائية، والفوسفور خاصة، مكوناً رئيسيًا من مكونات المنظفات. في جوهرها، كانت مياه الصرف الصحي المعالجة تسمد البحيرة بواسطة إثراها مع المغذيات الذائبة.

من المفهوم جيداً في عملية تخصيب المغذيات من البحيرات العذبة من قبل علماء البيئة والذي يطلق عليه زيادة المغذيات. زيادة المغذيات غير مرغوب فيه لأن كوميتا وأندرسون قد بدأوا بالفعل بمراقبة، ارتفاع مستويات المغذيات، يساهم في نمو البكتيريا الزرقاء الخيطية. هذه الكائنات الضوئية تحتاج فقط ثلاثة أشياء لتنمو: ضوء لعملية التمثيل الضوئي "الذى يحصلون عليه من الشمس؛ ذرات الكربون، والذي يحصلون عليه من ثاني أكسيد الكربون المذاب في الماء، والمغذيات مثل النيتروجين والفوسفور، والتي كانت مقدمة من مياه الصرف الصحي المعالجة. بدون المغذيات، لا يمكن أن تنمو البكتيريا الزرقاء، إمدادات المغذيات، وسرعان ما يشكل حصائر من البكتيريا الزرقاء من الزيد الأخضر على سطح الماء، والماء يبدأ بتنـ رائحة متغيرة من المواد العضوية.

ثم المشكلة الخطيرة تبدأ كما يلي: بكتيريا المياه العميقة التي تتحلل مجموعات من البكتيريا الزرقاء الميتة تتضاعف بشكل انفجاري تستهلك كميات كبيرة من الأكسجين في هذه العملية، وحتى المياه العميقة في البحيرة تصبح مستنفدة بحيث أنها لم تعد قادرة على دعم الكائنات الحية الأخرى التي تحتاج إلى الأكسجين لتعيش. يمكن لا تستطيع الأسماك استخراج ما يكفي من الأكسجين من خلال الخياشيم الخاصة بها، ويمكن لا يتحمل عدداً يحصى "من اللافقاريات الصغيرة" التي تقطن في بحيرات المياه العذبة.

7 On July 11, 1955, the local newspaper mentioned the Pollution Control Commission's technical report in an article entitled, "Lake's Play Use Periled by Pollution." The article did not grab the public's attention, but a month later, something else did: the annual Gold Cup Yacht¹³ Races, when spectators saw magnificent sailboats slicing cleanly through green scum and smelled the odor of rotting cyanobacteria. These detractions to what had been a popular summer holiday raised protest among spectators and lakeshore residents.



Collecting clumps of cyanobacteria in Lake Washington during the 1950s

8 On the day of the yacht race, Anderson collected a water sample from the lake that contained a filamentous cyanobacterium that neither Anderson nor earlier investigators had ever encountered in large numbers in the lake: *Oscillatoria rubescens*. The presence of this cyanobacterium proved to be a vital clue. When Anderson's professor at the University of Washington, W.T. Edmondson, reviewed the literature on eutrophication, he came across the name *Oscillatoria rubescens* again and again in the lists of organisms found in polluted lakes.

13. **yacht** (yät) *n.* Expensive sailing or motor-driven boat used for pleasure cruises or racing.

في 11 يوليو ١٩٥٥، الصحف المحلية ذكرت التقرير جنة مراقبة التلوث الفني في مقال بعنوان "استخدام بحيرة في المبارزة Periled من التلوث". المادة لم تجذب انتباه الناس، ولكن بعد شهر واحد، فعل شيء آخر: كأس سباقات اليخوت الذهبية السنوية، بينما رأى المشاهدين المراكب الشراعية الرائعة تقطع بشكل نظيف على الرغم من الزبد الأخضر ورائحة البكتيريا الزرقاء المتعفنة. هذه الانتقادات لـ التي كانت عطلة صيفية شعبية أثارت احتجاج بين المشاهدين وسكان ساحل البحيرة.

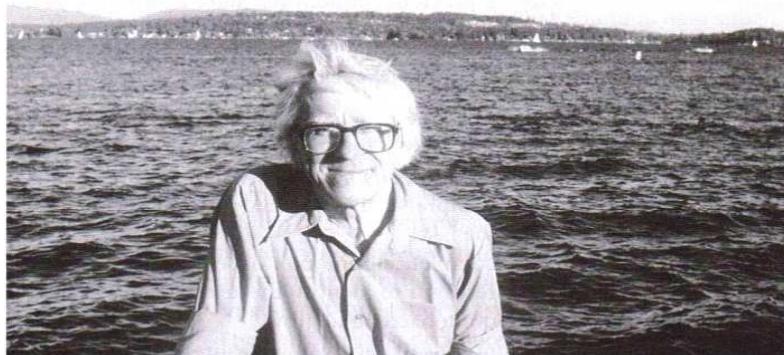


في يوم سباق اليخوت، أندرسون جمع عينة مياه من البحيرة التي تحتوي على البكتيريا الزرقاء الخيطية التي لم يواجهها أندرسون ولا المحققين أبداً من قبل في أعداد كبيرة في البحيرة: *Oscillatoria Rubescens* ليكون لديه فكرة حيوية. عندما أستعرض أندرسون البروفيسور في جامعة يوашنطن، أدمونسون ماكتب حول زيادة الغذاء، صادف الاسم *Oscillatoria Rubescens* مراراً وتكراراً في قوائم الكائنات الحية التي وُجدت في البحيرات الملوثة.

9 To Edmondson, the abundance of *oscillatoria* in Lake Washington was a clear warning. On October 13, 1955, the *University of Washington Daily* ran a story, "Edmondson Announces Pollution May Ruin Lake," in which Edmondson announced the likely meaning of the large masses of *oscillatoria*. From this point on, the scientific case was clear: the eutrophication of Lake Washington was demonstrably at an advanced stage, and unless it was reversed, it would soon destroy the water quality of the lake.

Scientific Assessment

10 Scientific assessment of an environmental problem verifies that a problem exists and builds a sound set of observations on which to base a solution. Lake Washington's microscopic life had been the subject of a detailed study in 1933. Thus, when the telltale¹⁴ signs of pollution first appeared in 1950, Edmondson's student quickly detected changes from the previous study. Without the earlier study's careful analyses of the many microorganisms living in the lake, understanding the changes that were occurring would have been delayed or possibly missed entirely.



W.T. Edmondson on Lake Washington

14. **tell•tale** (tĕl'tāl') *adj.* Serving to indicate or reveal.

إلى إدموندسون، كانت كثرة التنبُّب في بحيرة واشنطن تحذيراً واضحاً. في ١٣ أكتوبر ١٩٥٥، نشرت صحفة جامعة واشنطن اليومية قصة "إدموندسون يعلن أن التلوث قد يدمر البحيرة" والذي أعلن إدموندسون المعنى المحتمل للتجمع الكبير للتنبُّب، منْ هذه النقطة، الحالة العلمية كانت واضحة: التسبُّب الغذائي لبحيرة واشنطن كان واضح في مرحلة متقدمة، وإلا إذا كان العكس، فإنه سوف يدمر قريباً نوعية المياه للبحيرة.

التقييم العلمي

التقييم العلمي للمشكلة البيئية يتحقق من وجود المشكلة وتبني مجموعة سليمة من الملاحظات تستند إليها في التوصل إلى حل. كانت حياة بحيرة واشنطن المجهرية موضوع دراسة مفصلة في ١٩٣٣. هكذا، عندما قال الراوي "ظهرت علامات التلوث للمرة الأولى في ١٩٥٠، الطالب إدموندسون اكتشف التغييرات بسرعة من الدراسة السابقة. بدون تحاليل الدراسة الدقيقة السابقة للعديد من الكائنات الحية المجهرية التي تعيش في البحيرة، فهم التغييرات التي كانت تحدث كان يمكن أن تكون متأخرة أو تفقد من المحتمل كلّاً.



11 Edmondson examined and compared the earlier study of the lake and confirmed that there had indeed been a great increase in dissolved nutrient in the lake's water. Surmising¹⁵ that the added nutrients were the result of sewage treatment discharge into the lake by suburban communities, Edmondson formed the hypothesis that treated sewage was introducing so many nutrients into the lake that its waters were beginning to support the growth of photosynthetic cyanobacteria.

12 Edmondson's hypothesis made a clear prediction: the continued addition of phosphates¹⁶ and other nutrients to the lake would change its surface into a stinking mat of rotting cyanobacteria, unfit for swimming or drinking, and the beauty of the lake would be only a memory. Bolstering¹⁷ his prediction was the fact the lakes near other cities, such as Madison, Wisconsin, had deteriorated after receiving discharges of treated sewage.

Making a Model

13 Edmondson constructed a graphical model of the lake, which predicted that the decline could be reversed: if the pollution were stopped, the lake would clean itself at a predictable rate, reverting to its previous, unpolluted state within five years. In freshwater lakes, iron reacts with phosphorus to form an insoluble complex that sinks to the bottom of the lake and is buried in the sediments.¹⁸ Thus, if additional phosphorus was not introduced into the lake from sewage effluent, the lake would slowly recover. In April 1956, Edmondson outlined three steps that would be necessary in any serious attempt to save the lake:

1. comprehensive regional planning by the many suburbs that ringed the lake;
2. complete elimination of sewage discharge into the lake; and,
3. research to identify the key nutrients that were causing the cyanobacteria to grow.

His proposals received widespread publicity in the Seattle area, and the stage was set to bring scientists and civic leaders together.

15. **sur•mis•ing** (sər-mīz'ing) *v.* Concluding or guessing something on little evidence.

16. **phos•phate** (fōs'fāt') *n.* Phosphorus-containing compound, often used in fertilizers and detergents.

17. **bol•ster•ing** (bōl'stər-ing) *v.* Strengthening; supporting.

18. **sed•i•ment** (sēd'ə-mənt) *n.* Tiny pieces of solid matter, such as dirt, that fall to



Risk Analysis

14 It is one thing to suggest that the addition of treated sewage to Lake Washington stop, and quite another to devise an acceptable alternative. Further treatment of sewage can remove some nutrients, but it may not be practical to remove all of them. The alternative is to dump the sewage somewhere else—but where? In this case, officials decided to discharge the treated sewage into Puget Sound. In their plan, a ring of sewers to be built around the lake would collect sewage treatment discharges, treat them further, and then transport them to be discharged at great depth into Puget Sound.

15 Why go to all the trouble and expense of treating the discharges further, if you are just going to dump them? And why bother discharging them deep under water? It is important that the solution to one problem not produce another. The plans to further treat the discharge and release it at great depth were formulated in an attempt to minimize the environmental impact of diverting Lake Washington's discharge into Puget Sound. It was assumed that sewage effluent would have less of an impact on the greater quantity of water in Puget Sound than on the much smaller amount of water in Lake Washington. Also, nutrient chemistry in marine waste is different from that in fresh water. Puget Sound is naturally rich in nutrients, and phosphate does not control cyanobacterial growth there as it does in Lake Washington. The growth of photosynthetic bacteria and algae in Puget Sound is largely limited by tides, which mix the water and transport the tiny organisms into deeper water, where they cannot get enough light to grow rapidly.

16 Practically any course of action that can be taken to address an environmental problem has its own impacts on the environment, which must be assessed when evaluating potential solutions. Environmental impact analyses often involve studies by geographers, chemists, and engineers as well as ecologists and other biologists. Furthermore, the decision whether to implement a plan to restore or protect the environment is almost always affected by social, political, and economic concerns. Any proposal is inevitably and rightly constrained by existing laws and by the citizens who will be affected by the decision.





The Evergreen Floating Bridge across Lake Washington

Public Education

17 Despite the technical bulletin published by the Washington Pollution Control Commission in 1955, local sanitation authorities were not convinced that urgent action was necessary. Public action requires further education, and it was at this stage the scientists played a key role. Edmondson and other scientists wrote articles for the general public that contained concise¹⁹ explanations of what nutrient enrichment is and what problems it causes. The general public's awareness of the problem increased as local newspapers published these articles.

18 In December 1956, Edmondson wrote a letter in an effort to alert a committee established by the mayor of Seattle to examine regional problems affecting Seattle and its suburbs. Edmondson explained that even well-treated sewage would soon destroy the lake, and that Lake Washington was already showing signs of deterioration. He received an encouraging response and prepared for the committee a nine-page report of his scientific findings. After presenting his data showing that the mass of cyanobacteria varied

19. **con•cise** (kən-sīs') *adj.* Said in a few words.



in strict proportion to the amounts of nutrients being added to the lake, Edmondson posed a series of questions: "How has Lake Washington changed?" "What will happen if nothing is done to halt nutrient accumulation?" "Why not poison the cyanobacteria and then continue to discharge the effluent?" He then answered the questions and outlined two alternative courses of public action—do nothing, or stop adding nutrients to the lake—and made a clear prediction about the consequences of each.

Political Action

19 Edmondson's report was widely circulated among local governments, but implementing its proposals presented serious political problems because there was no governmental mechanism that would permit the many local suburbs to act together on regional matters such as sewage disposal. On September 9, 1958, voters approved a public referendum²⁰ to create a regional government to deal with the sewage disposal problem.

20 At the time it was passed, the Lake Washington plan was the most ambitious and most expensive pollution control project in the United States. Every household in the area had to pay \$2 a month in additional taxes for construction of a massive trunk sewer to ring the lake, collect all the effluent, treat it, and discharge it into Puget Sound.



Building a new sewer trunk line around Lake Washington

20. **referendum** (rē'fə-rēn'dəm) *n.* A direct vote by the people on an issue rather than on a candidate.



21 Groundbreaking ceremonies for the new project were held in July 1961. As Edmondson had predicted, the lake had deteriorated further. In 1963, the first of the waste treatment plants around the lake began to divert its effluent into the new trunk sewer. One by one, the others diverted theirs until the last effluent was diverted in 1968. The lake's deterioration stopped by 1964, and then its condition began to improve.

Follow-Through

22 By carefully analyzing what was happening in the lake, Edmondson could predict that the lake would recover fully. Some environmental scientists disagreed with him, arguing that dissolved phosphorus, the key nutrient regulating cyanobacterial growth, would not dissipate for decades, if ever. A lot depended on assumptions about the chemical makeup of the sediment at the bottom of the lake. Edmondson's hypothesis was correct. Water returned to normal within a few years. *Oscillatoria* persisted until 1970, but eventually it disappeared. By 1975 the lake was back to normal.

23 Every environmental intervention is an experiment, and continued monitoring is necessary because environmental scientists work with imperfect tools. There is a great deal we do not know, and every added bit of information increases our ability to deal with future problems. The unanticipated always lurks just beneath the surface of any experiment carried out in nature. It was not anticipated, for example, that the quality of the water would continue to get better. By 1980, the lake was cleaner than at any time in recent memory. Before the recovery, the presence of filamentous cyanobacteria such as *oscillatoria* had limited the population of a microscopic organism called *daphnia* because cyanobacterial filaments clog *daphnia*'s feeding apparatus. The disappearance of *oscillatoria* and other filamentous cyanobacteria allowed the lake's *daphnia* population to flourish²¹ and become dominate among the many kinds of invertebrates that lived there. Because *daphnia* are very efficient eaters of nonfilamentous algae, levels of these algae fell, too, so that the water became even clearer.

21. **flourish** (flûr'îsh) *v.* To grow or develop well or in great amounts.

Working Together

24 The reversal of the pollution of Lake Washington is a particularly clear example of how environmental science can work to identify, address, and help solve environmental problems. Many environmental problems facing us today are far more complex than Lake Washington's, however, and public attitudes are often different. Lake Washington's pollution problem was solved only because the many small towns involved in the problem cooperated in seeking a solution.

25 Today, confrontations over an environmental problem frequently make it difficult to reach an agreement. Even scientists disagree among themselves and call for additional research to help them arrive at a consensus. In such an atmosphere, politicians often compromise by adopting a "wait-and-see" approach.

26 Such delays are really a form of negative action because the consequences of many environmental problems are so serious that they must be acted on before a scientific consensus is reached. The need for additional scientific studies should not prevent us from taking action on such serious regional and global issues as stratospheric ozone depletion and global climate warming. We need to recognize the uncertainty inherent in environmental problems, consider a variety of possible approaches, weigh the cost, benefits, and probable outcomes of each, and set in motion a policy that is flexible enough to allow us to modify it as additional information becomes available. In the final analysis, then, environmental scientists identify a problem and often suggest a solution, but implementation depends on a political decision that is influenced by social and economic agendas as well as scientific evidence.

Raven, P. H., & Berg, L. R. (2001). *Environment* (3rd ed.) (pp. 31–36). Hoboken, NJ: John Wiley & Sons.

**Muscle
Reading
Reminder**
Phase Three:
Recite
Review
Review Again

STRATEGY

When you learn collocations, you can learn English more quickly because you not only know the word but you also know other words that go with it. Look for collocations whenever you read. This will help you learn vocabulary more quickly and easily.



Reading Selection 1

MACROECONOMICS: THE BIG PICTURE

Introduction

- 1 **A**n economic expansion is a period of continuous economic growth without a significant economic downturn. In 2001, the longest economic expansion in American history came to an end. The record-breaking expansion had begun in 1991; throughout the decade, unemployment was low and falling, as is often the case in an expansion, and spending by consumers and investors was very robust.
- 2 An economic downturn that ends an expansion is known as a recession. During 2001, unemployment increased, as it often does in a recession, and spending by consumers and business firms fell. While the tragic events of September 11 contributed substantially to the economy's going into recession, all indications were that the economic slowdown had begun almost six months earlier. Once the signs of recession were evident, the President, members of Congress, and the Federal Reserve¹ expressed their concern and moved quickly to implement policies that they claimed would help the economy return to a period of expansion.
- 3 Recent economic data seem to indicate that the slowdown was short-lived: the longest economic expansion on record seems to have been followed by one of the shortest recessions on record. Why was the expansion so long? What caused the economy to go into recession? Why was the recession so short-lived? Did the policy responses put in place in 2001 help the economy out of the recession? These are the types of questions that the study of macroeconomics helps us answer.
- 4 Macroeconomics is the study of the *whole market economy*. Like other parts of economics, macroeconomics uses the central idea that people make purposeful decisions with scarce resources. However, instead of focusing on the workings of one market—whether the market for peanuts or the market for bicycles—macroeconomics focuses on the economy as a whole. Macroeconomics looks at the big picture: Economic growth,

1. *Federal Reserve* = A U.S. banking system that consists of twelve federal reserve banks, each one serving member banks within its own district.

Chapter 5: Seeing the Big Picture

recessions, unemployment, and inflation are among its subject matter. You should accordingly put on your "big picture glasses" when you study macroeconomics.

- 5 Macroeconomics is important to you and your future. For example, you will have a much better chance of finding a desirable job after you graduate from college during a period of economic expansion than during a period of recession. Strong economic growth can help alleviate poverty, free up resources to clean up the environment, and lead to a brighter future for your generation. By studying macroeconomics, you can better understand the changes that are taking place in the economy, better understand the role of good economic policies in driving economic growth and reducing unemployment, and become a more informed and educated citizen.
- 6 This chapter summarizes the overall workings of the economy, highlighting key facts to remember. It also provides a brief preview of the macroeconomic theory designed to explain these facts. The theory will be developed in later chapters.

Source: Taylor, J. (2004). *Economics* (4th ed.). Boston: Houghton Mifflin Company, pp. 24–25.



Assumptions Supporting Statements of Theory

When you read passages about economics, it is important to think through stated theories by considering ideas that are tied to the theories. There are ideas behind theories, and there are policy decisions that follow from theories. Consider the following definitions.

the · o · ry (thé'ə-rē) *n., pl. the · o · ries*

A statement or set of statements designed to explain an event or group of events.

as · sump · tion (ə-sümp'shən) *n.*

An idea or statement accepted as true without proof; a supposition.

in · fer · ence (in'-fər-əns) *n.*

The act of arriving at an opinion or idea based on factual knowledge or evidence.

Theories, assumptions, and inferences are related because, in each case, we are working from observations. On a daily basis, we make inferences based on assumptions. Knowing that an assumption is supported by a theory can lend confidence to decision making. To make these idea connections takes practice. We often come to conclusions or make inferences about situations we are part of or observe. We give meaning to situations through interpretations. Our interpretations are based on assumptions.

Source: Definitions from *The American Heritage English as a Second Language Dictionary*. (1998). Boston: Houghton Mifflin Company.



Muscle
Reading
Reminder
Phase Two:
Read
Underline
Answer

Reading Selection 2

REAL GDP OVER TIME

¹ Gross domestic product (GDP) is the economic variable of most interest to macroeconomists. GDP is the total value of all goods and services produced in the economy during a specified period of time, usually a year or a quarter. The total value of goods and services can change either because the quantities of goods and services are changing or because their prices are changing. As a result, economists often prefer to use **real gross domestic product**¹ (**real GDP**) as the measure of production; the adjective *real* means that we adjust the measure of production to account for changes in prices over time. Real GDP, also called *output* or *production*, is the most comprehensive measure of how well the economy is doing.

² Figure 17.1 shows the changes in real GDP in recent years in the United States. When you look at real GDP over time, as in Figure 17.1, you notice two simultaneous patterns emerging. Over the long term, increases in real GDP demonstrate an upward trend, which economists call long-term **economic growth**.² In the short term, there are **economic fluctuations**³—more transient increases or decreases in real GDP. These short-term fluctuations in real GDP are also called *business cycles*. The difference between the long-term economic growth trend and the economic fluctuations can be better seen by drawing a relatively smooth line between the observations on real GDP. Such a smooth trend line is shown in Figure 17.1. Sometimes real GDP fluctuates above the trend line, and sometimes it fluctuates below the trend line. In this section we look more closely at these two patterns: economic growth and economic fluctuations.

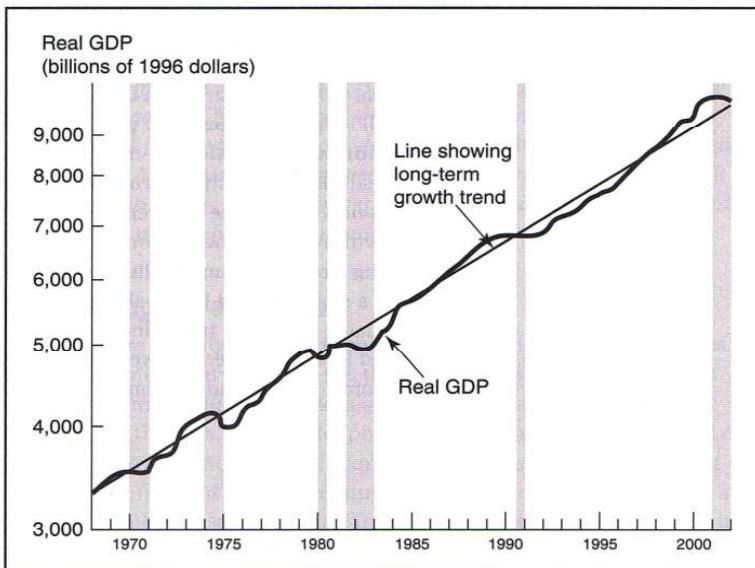
1. *real gross domestic product (real GDP)* = A measure of the value of all goods and services newly produced in a country during some period of time, adjusted for changes in prices over time.
2. *economic growth* = An upward trend in real GDP, reflecting expansion in the economy over time.
3. *economic fluctuations* = Swings in real GDP that lead to deviations of the economy from its long-term growth trend.



Economic Growth: The Relentless Uphill Climb

3 The large increase in real GDP shown in Figure 17.1 means that people in the United States now produce a much greater amount of goods and services each year than they did 30 years ago. Improvements in the economic well-being of individuals in any society cannot occur without such an increase in real GDP. To get a better measure of how individuals benefit from increases in real GDP, we consider average production per person, or *real GDP per capita*. Real GDP per capita is real GDP divided by the number of people in the economy. It is the total production of all food, clothes, cars, houses, CDs, concerts, education, computers, etc., per person. When real GDP per capita is increasing, then the well-being—or the standard of living—of individuals in the economy, at least on average, is improving.

Figure 17.1 Economic Growth and Fluctuations

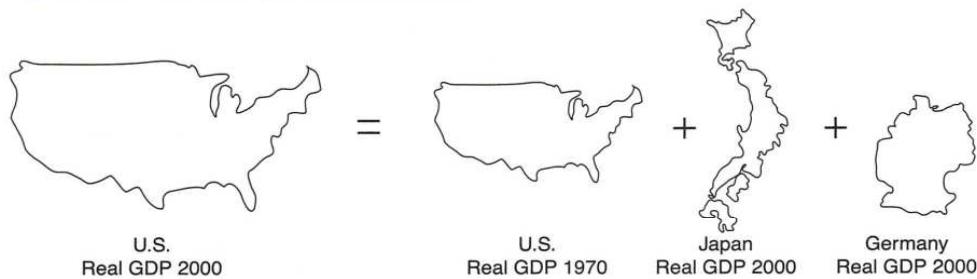


Real GDP has grown by more than \$5 trillion during the last 30 years. The trend in growth is shown by the black line. At the same time, the economy has fluctuated up and down as it has grown, with six recessions—marked by the vertical shaded bars—and five subsequent expansions since 1970.



4 How much economic growth has there been during the last 30 years in the United States? The annual economic growth rate—the percentage increase in real GDP each year—provides a good measure. On the average, for the last 30 years, the annual economic growth rate has been about 3 percent. This may not sound like much, but it means that real GDP has nearly tripled. The increase in production in the United States over the past 30 years is larger than what Japan and Germany together now produce. It is as if all the production of Japan and Germany—what is made by all the workers, machines, and technology in these countries—were annexed to the U.S. economy, as illustrated in Figure 17.2.

Figure 17.2 Visualizing Economic Growth

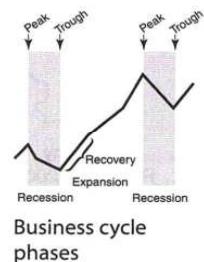


Over the last 30 years, production in the U.S. economy has increased by more than the total current production of the Japanese and German economies combined. It is as if the United States had annexed Germany and Japan.

5 How much has real GDP *per capita* increased during this period? Because the U.S. population increased by about 100 million people during this period, the increase in real GDP per capita has been less dramatic than the increase in real GDP, but it is impressive nonetheless. The annual growth rate of real GDP per capita is the percentage increase in real GDP per capita each year. It has averaged about 1.7 percent per year. Again, this might not sound like much, but it has meant that real GDP per capita doubled from about \$10,000 per person in the 1950's to about \$20,000 per person in the 1990's. That extra \$10,000 per person represents increased opportunities for travel, VCRs, housing, washing machines, aerobics classes, health care, antipollution devices for cars, and so on.



6 Over long spans of time, small differences in economic growth—even less than 1 percent per year—can transform societies. For example, economic growth in the southern states was only a fraction of a percent greater than in the North in the 100 years after the Civil War. Yet this enabled the South to rise from a real income per capita about half that of the North after the Civil War to one about the same as that of the North today. Economic growth is the reason that Italy has caught up with and even surpassed the United Kingdom in real GDP per capita; 100 years ago, Italy had a real GDP per capita about half that of the United Kingdom. Economic growth is also key to improvements in the less-developed countries in Africa, Asia, and Latin America. Because economic growth has been lagging in many of these countries, their real GDP per capita is considerably less than that of the United States.



Economic Fluctuations: Temporary Setbacks and Recoveries

7 Clearly, real GDP grows over time, but every now and then real GDP stops growing, falls, and then starts increasing rapidly again. These ups and downs in the economy—that is, economic fluctuations or business cycles—can be seen in Figure 17.1.

8 One of these business cycles, the one in the early 1990's, is blown up for closer examination in Figure 17.3. No two business cycles are alike. Certain phases are common to all business cycles, however. These common phases are shown in the diagram in the margin. When real GDP falls, economists say that there is a **recession**,⁴ a rule of thumb says that the fall in real GDP must last for a half year or more before the **decline** is considered a recession. The highest point before the start of a recession is called the **peak**.⁵ The lowest point at the end of a recession is called the **trough**,⁶ a term that may cause you to imagine water accumulating at the bottom of one of the dips.

9 The period between recessions—from the trough to the next peak—is called an **expansion**,⁷ as shown for a typical fluctuation in the margin. The early part of an expansion is usually called a **recovery**⁸ because the economy is just recovering from the recession.

4. *recession* = A decline in real GDP that lasts for at least six months.

5. *peak* = The highest point in real GDP before a recession.

6. *trough* = is the lowest point of real GDP at the end of a recession.

7. *expansion* = The period between the trough of a recession and the next peak, consisting of a general rise in output and employment.

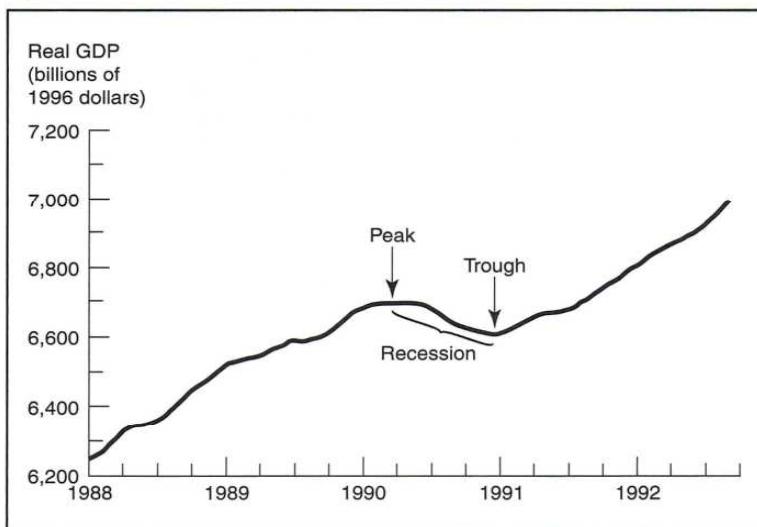
8. *recovery* = The early part of an economic expansion, immediately after the trough of the recession.



10 The peaks and troughs of the six recessions since the late 1960's are shown by vertical bars in Figure 17.1. The shaded areas represent the recessions. The area between the shaded bars shows the expansions. The dates of all peaks and troughs back to 1920 are shown in Table 17.1. The average length of each business cycle from peak to peak is five years, but it is clear from Table 17.1 that business cycles are not regularly occurring ups and downs, like sunup and sundown. Recessions occur irregularly. There were only 12 months between the back-to-back recessions of the early 1980's, while 58 months of uninterrupted growth occurred between the 1973-1975 recession and the 1980 recession. The recession phases of business cycles also vary in duration and depth. The 1980 recession, for example, was not nearly as long or as deep as the 1973-1975 recession.

11 The 1990-1991 recession was one of the shortest recessions in U.S. history, and it was followed by the longest expansion in U.S. history. Before that recession, almost uninterrupted economic growth had occurred for most of the 1980's—from the trough of the previous recession in November 1982 to a peak in July 1990.

Figure 17.3 The Phases of Business Cycles



Although no two business cycles are alike, they have common features, including the *peak*, *recession*, and *trough*, shown here for 1990-1991.



12 Economists debate whether economic policies were responsible for the expansions of the 1980's and 1990's. We will examine these debates in later chapters. Another debate is the cause of the recession that began in 1990. The first month of the recession occurred just after Iraq invaded Kuwait, causing a disruption in the oil fields and a jump in world oil prices. Some argue that this jump in oil prices was a factor in the recession.

13 **A Recession's Aftermath.** The economy usually takes several years to return to normal after a recession. Thus, a period of bad economic times always follows a recession while the economy recovers. Remember that economists define recessions as periods in which real GDP is declining, not as periods in which real GDP is down. Despite the technical definition, many people still associate the word *recession* with bad economic times. For example, although the 1990–1991 recession ended in March 1991, most people felt that the bad economic times extended well into 1992, and they were right. But, technically speaking, the recession was over in March 1991 when GDP began to grow again—well before the effects of an improving economy were felt by most people.

14 **Recessions versus Depressions.** Recessions have been observed for as long as economists have tracked the economy. Some past recessions lasted so long and were so deep that they are called *depressions*. There is no formal definition of a depression. A depression is a huge recession.

15 Fortunately, we have not experienced a depression in the United States for a long time. Figure 17.4 shows the history of real GDP for about 100 years. The most noticeable decline in real GDP occurred in the 1929–1933 recession. Real GDP fell by 32.6 percent in this period. This decline in real GDP was so large that it was given its own designation by economists and historians—the *Great Depression*. The recessions of recent years have had much smaller declines.

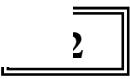
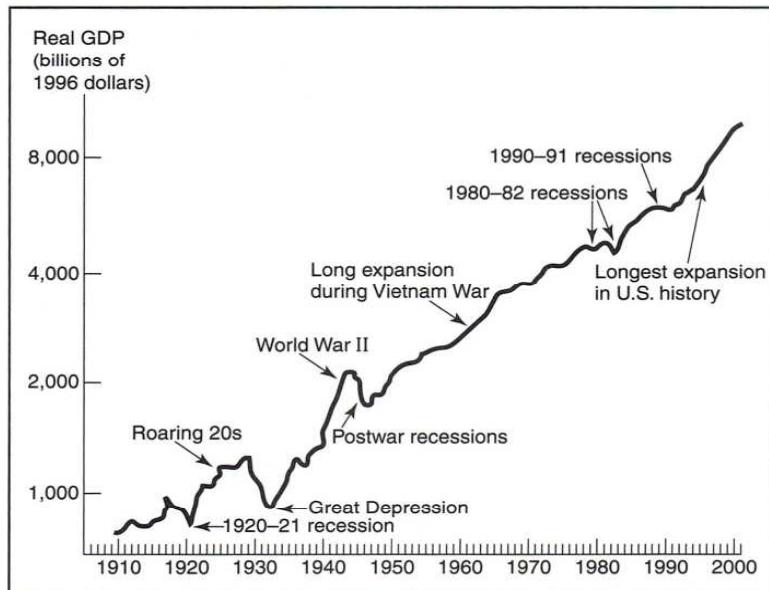


Figure 17.4 Growth and Fluctuations Throughout the Twentieth Century



Economic growth has continued, but the size of economic fluctuations has diminished remarkably. Recent ups and downs are minuscule in comparison with the Great Depression.

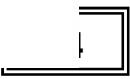
16 Table 17.1 shows how much real GDP fell in each of the fifteen recessions since the 1920's. The 1920–1921 recession and the 1937–1938 recession were big enough to be classified as depressions, but both are small compared to the Great Depression. Real GDP also declined substantially after World War II, when war production declined.

Table 17.1 Comparison of Recessions

Recession		Duration of Recession (months from peak to trough)	Decline in Real GDP (percent from peak to trough)	Duration of Next Expansion (months from trough to peak)
Peak	Trough			
Jan 1920–Jul 1921		18	8.7	22
May 1923–Jul 1924		14	4.1	27
Oct 1926–Nov 1927		13	2.0	21
Aug 1929–Mar 1933		43	32.6	50
May 1937–Jun 1938		13	18.2	80
Feb 1945–Oct 1945		8	11.0	37
Nov 1948–Oct 1949		11	1.5	45
Jul 1953–May 1954		10	3.2	39
Aug 1957–Apr 1958		8	3.3	24
Apr 1960–Feb 1961		10	1.2	106
Dec 1969–Nov 1970		11	1.0	36
Nov 1973–Mar 1975		16	4.9	58
Jan 1980–Jul 1980		6	2.5	12
Jul 1981–Nov 1982		16	3.0	92
Jul 1990–Mar 1991		8	1.4	120
Mar 2001–		13*		

*As of April 2002.

Source: National Bureau of Economic Research



17 Clearly, recent recessions have not been even remotely comparable in severity to the Great Depression or the other huge recessions of the 1920's and 1930's. The 1990–1991 recession, for example, had only one-twentieth the decline in real GDP that occurred during the Great Depression. But because any recession rivets attention on people's hardship and suffering, there is always a tendency to view a current recession as worse than all previous recessions. Some commentators reporting on the 1990–1991 recession wondered whether it should be compared with the Great Depression. For example, in September 1992, Louis Uchitelle of the *New York Times* wrote, "Technically, the recession is over, but spiritually, it continues ... The question is, what to call these hard times. What has been happening in America since 1989 seems momentous enough to enter history as a major economic event of the 20th century."^{*}

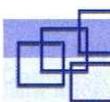
Review

- Economic growth and economic fluctuations occur simultaneously.
- Economic growth provides lasting improvements in the well-being of people. But recessions interrupt this growth.
- The Great Depression of the 1930's was a much larger downturn than recent recessions. It was about twenty times more severe than the 1990–1991 recession when measured by the decline in real GDP.

Source: Taylor, J. (2004). *Economics* (4th ed.). Boston: Houghton Mifflin Company. pp. 25–31.

^{*}Louis Uchitelle, "Even Words Fail in This Economy," *New York Times*, September 8, 1992, p. C2.





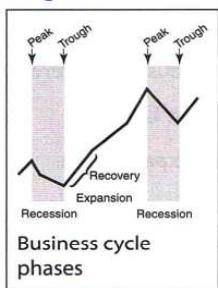
STRATEGY

Interpreting Graphs and Tables

Selection 2, about GDP, contains four figures and one table. The figures are labeled 17.1, 17.2, 17.3, and 17.4. The table is labeled 17.1. The number 17 indicates that they come from Chapter 17 in Taylor's textbook. When you study economics, you will need to interpret graphs and sometimes produce graphs. For the next exercise, we work with interpretation. What are the graphs illustrating? To begin, practice explaining this basic figure.

First, it is important to find the part in the reading that can help you explain it. In the example below, paragraphs 8 and 9 include the information you need to interpret the model graph on the left. Notice that the first and second sentences do not really help you understand. The explanation for this model graph begins with the third sentence.

Diagram



8 One of these business cycles, the one in the early 1990's, is blown up for closer examination in Figure 17.3. No two business cycles are alike. Certain phases are common to all business cycles, however. These common phases are shown in the diagram in the margin. When real GDP falls, economists say that there is a recession; a rule of thumb says that the fall in real GDP must last for a half year or more before the decline is considered a recession. The highest point before the start of a recession is called the peak. The lowest point at the end of a recession is called the trough, a term that may cause you to imagine water accumulating at the bottom of one of the dips.

9 The period between recessions—from the trough to the next peak—is called an expansion, as shown for a typical fluctuation in the margin. The early part of an expansion is usually called a recovery because the economy is just recovering from the recession.



Reading Selection 3

UNEMPLOYMENT, INFLATION, AND INTEREST RATES

18 As real GDP changes over time, so do other economic variables, such as unemployment, inflation, and interest rates. Looking at these other economic variables gives us a better understanding of the human story behind the changes in real GDP. They also provide additional information about the economy's performance—just as a person's pulse rate or cholesterol level gives information different from the body temperature. No one variable is sufficient.

Unemployment During Recessions

19 There are fluctuations in unemployment just as there are fluctuations in real GDP. The **unemployment rate**¹ is the number

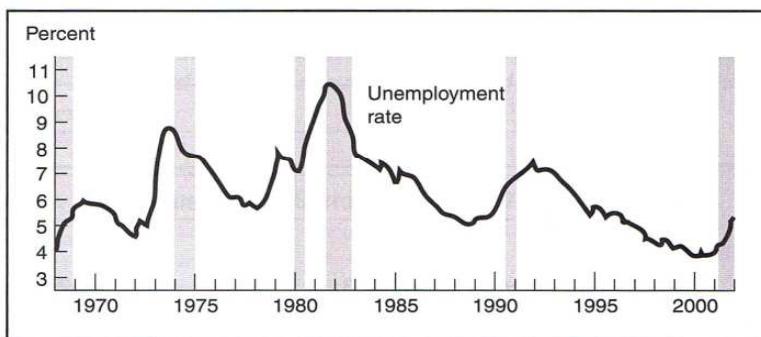
1. *unemployment rate* = The percentage of the labor force that is unemployed.



of unemployed people as a percentage of the labor force; the labor force consists of those who are either working or looking for work. Every time the economy goes into a recession, the unemployment rate rises because people are laid off and new jobs are difficult to find. The individual stories behind the unemployment numbers frequently represent frustration and distress.

20 Figure 17.5 shows what happens to the unemployment rate as the economy goes through recessions and recoveries. The increase in the unemployment rate during a recession is eventually followed by a decline in unemployment during the recovery. Note, for example, how unemployment rose during the recessions of 1969–1970 and 1973–1975. Around the time of the 1990–1991 recession, the unemployment rate rose from 5.2 percent to 7.7 percent.

Figure 17.5 The Unemployment Rate

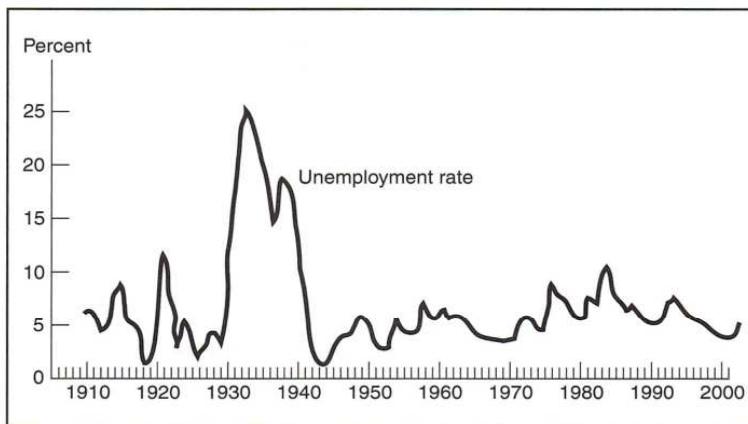


The number of unemployed workers as a percentage of the labor force—the unemployment rate—increases during recessions because people are laid off and it is difficult to find work. Sometimes the unemployment rate continues to increase for a while after the recession is over, as in 1971 and 1991. But eventually unemployment declines during the economic recovery.

21 Figure 17.6 shows how high the unemployment rate got during the Great Depression. It rose to over 25 percent; one in four workers was out of work. Fortunately, recent increases in unemployment during recessions have been much smaller. The unemployment rate reached 10.4 percent in the early 1980's, the highest level since World War II.



Figure 17.6 Unemployment During the Great Depression

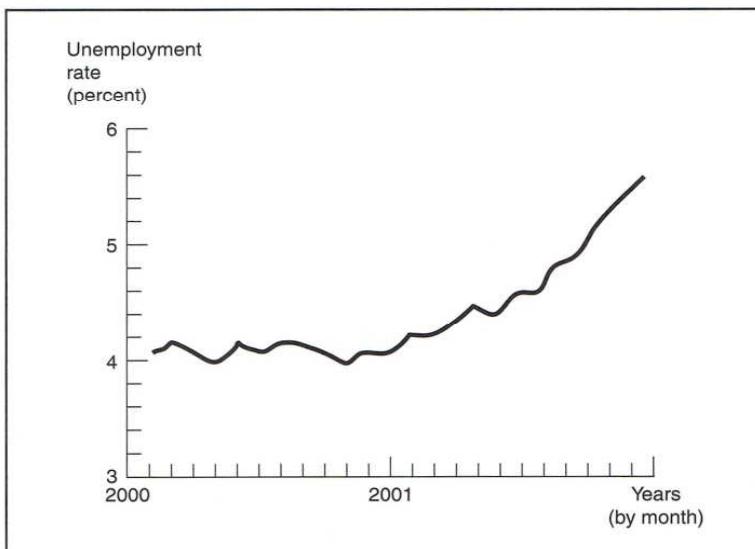


The increase in unemployment in the United States during the Great Depression was huge compared with the increases in unemployment during more mild downturns in the economy. More than one in four workers were unemployed during the Great Depression.

22 Even though the most recent recession pales in comparison to the Great Depression, it still caused a lot of pain and hardship across the country. Figure 17.7 illustrates how rapidly unemployment rose, even in what most economists described as a mild recession. In the 12 months from the end of 2000 to the end of 2001, the unemployment rate increased by almost 2 percentage points. To put this number in more human terms, the number of unemployed workers across the country increased by about 2.5 million.



Figure 17.7 The Rapid Rise in Unemployment in 2001



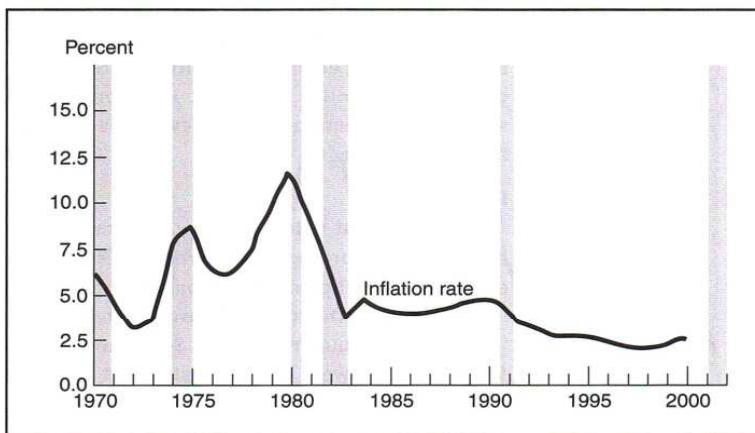
When the economy moves from expansion into recession, unemployment can climb very rapidly over a period of a few months, as we saw at the end of the long expansion in 2001.

Inflation

23 Just as output and unemployment have fluctuated over time, so has inflation. The inflation rate is the percentage increase in the average price of all goods and services from one year to the next. Figure 17.8 shows the **inflation rate** for the same 30-year period we have focused on in our examination of real GDP and unemployment. Clearly, a low and stable inflation rate has not been a feature of the United States during this period. There are several useful facts to note about the behavior of inflation.



Figure 17.8 The Ups and Downs in Inflation



Inflation has increased before each recession and then declined during and immediately after each recession. In addition, a longer-term upward trend in inflation began in the mid-1960's and, after several ups and downs, reached a peak in 1980. In 1981–1983, America had a disinflation—a decline in the rate of inflation.

24 First, inflation is closely correlated with the ups and downs in real GDP and employment: inflation increased prior to every recession in the last 30 years and then subsided during and after every recession. We will want to explore whether this close correlation between the ups and downs in inflation and the ups and downs in the economy helps explain economic fluctuations.

25 Second, there are longer-term trends in inflation. For example, inflation rose from a low point in the mid-1960's to a high point of double-digit inflation in 1980. This period of persistently high inflation from the mid-1960's until 1980 is called the *Great Inflation*. The Great Inflation ended in the early 1980's, when the inflation rate declined substantially. Such a decline in inflation is called *disinflation*. (When inflation is negative and the average price level falls, economists call it *deflation*).

26 Third, judging by history, there is no reason to expect the inflation rate to be zero, even on average. The inflation rate has averaged around 2 or 3 percent in the 1990's in the United States.

27 Why does inflation increase before recessions? Why does inflation fall during and after recessions? What caused the Great Inflation? Why is inflation not equal to zero even in more normal times, when the economy is neither in recession nor in boom? What can economic policy do to keep inflation low and stable? These are some of the questions and policy issues about inflation addressed by macroeconomics.

Interest Rates

28 The **interest rate** is the amount that lenders charge when they lend money, expressed as a percentage of the amount loaned. For example, if you borrow \$100 for a year from a friend and the interest rate on the loan is 6 percent, then at the end of the year you must pay your friend back \$6 in interest in addition to the \$100 you borrowed. The interest rate is another key economic variable that is related to the growth and change in real GDP over time.

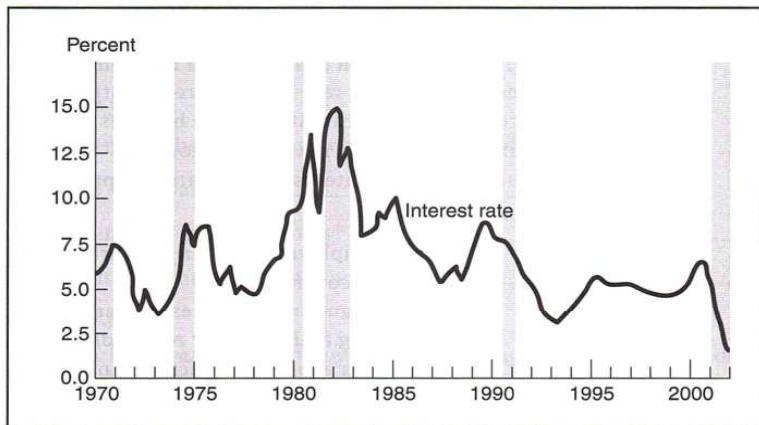
29 **Different Types of Interest Rates and Their Behavior.**

There are many different interest rates in the economy: the *mortgage interest rate* is the rate on loans to buy a house; the *savings deposit interest rate* is the rate people get on their savings deposits at banks; the *Treasury bill rate* is the interest rate the government pays when it borrows money from people for a year or less; the *federal funds rate* is the interest rate banks charge each other on very short-term loans. Interest rates influence people's economic behavior. When interest rates rise, for example, it is more expensive to borrow funds to buy a house or a car, so many people postpone such purchases.

30 Figure 17.9 shows the behavior of a typical interest rate, the federal funds rate, during the last 30 years. First, note how closely the ups and downs in the interest rate are correlated with the ups and downs in the economy. Interest rates rise before each recession and then decline during and after each recession. Second, note that, as with the inflation rate, there are longer-term trends in the interest rate. The interest rate rose from the mid-1960's until the 1980's. Each fluctuation in interest rates during this period brought forth a higher peak in interest rates. Then, in the 1980's, the interest rate began a downward trend; each peak was lower than the previous peak. By the early 1990's, interest rates had returned to the levels of the early 1970's.



Figure 17.9 The Ups and Downs in Interest Rates



Interest rates generally rise just before a recession and then decline during and just after the recession. There was also a longer-term trend upward in interest rates in the 1970's and a downward trend in the 1980's and 1990's. (The interest rate shown here is the federal funds interest rate.)

31 **The Concept of the Real Interest Rate.** As we will see, the trends and fluctuations in interest rates are intimately connected with the trends and fluctuations in inflation and real GDP. In fact, the long-term rise in interest rates in the 1960's and 1970's was partly due to the rise in the rate of inflation. When inflation rises, people who lend money will be paid back in funds that are worth less because the average price of goods rises more quickly. To compensate for this decline in the value of funds, lenders require a higher interest rate. For example, if the inflation rate is 20 percent and you lend someone \$100 for a year at 6 percent, then you get back \$106 at the end of the year. However, the *average* price of the goods you can buy with your \$106 is now 20 percent higher. Thus, your 6 percent gain in interest has been offset by a 20 percent loss. It is as if you receive *negative* 14 percent interest: 6 percent interest less 20 percent inflation. The difference between the stated interest rate and the inflation rate is thus a better measure of the real interest rate. Economists define the **real interest rate** as the interest rate less the inflation rate people expect. The term **nominal interest rate** is used to refer to the interest rate on a



loan, making no adjustment for inflation. For example, the real interest rate is 2 percent if the nominal interest rate is 5 percent and inflation is expected to be 3 percent ($5 - 3 = 2$). To keep the real interest rate from changing by a large amount as inflation rises, the nominal interest rate has to increase with inflation. Thus, the concept of the real interest rate helps us understand why inflation and interest rates have moved together. We will make much more use of the real interest rate in later chapters.

Review

- The unemployment rate rises during recessions and falls during recoveries.
- Inflation and interest rates rise prior to recessions and then fall during and just after recessions.
- There was a long-term increase in interest rates and inflation in the 1970's. Interest rates and inflation were lower in the 1990's.

Source: From Taylor, J. (2004). *Economics* (4th ed.). Boston: Houghton Mifflin Company, pp. 31–36.



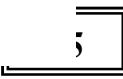
Reading Selection 4

ECONOMICS IN ACTION

The Economic Impact of September 11

1 The tragic events of September 11, 2001, left a trail of human destruction that was hitherto almost unimaginable. In the days and months following September 11, people all over the United States tried to assess the human and economic toll of the events of that fateful day. The assessment that many macroeconomists were asked to make was to calculate the economic impact of the events of September 11. As the economist Paul Krugman, who is also a regular columnist for the *New York Times*, said in his Op-Ed column a few days after September 11, "It seems almost in bad taste to talk about dollars and cents after an act of mass murder. Nonetheless, we must ask about the economic aftershocks from Tuesday's horror." Macroeconomic theory can help us understand the long- and short-term economic impact of this and other such tragedies.

2 In the case of September 11, the most obvious short-term costs were the destruction of life and property in New York, Washington, D.C., and Pennsylvania; the disruption of financial markets, given that many large financial institutions were located in and around the World Trade Center; and the costs to airlines from disruptions in air travel in the days following the tragedy. However, the theory of economic fluctuations, presented in Chapters 23 and 24, tells us that spending shocks have feedback effects that aggravate the initial direct effects. In the case of New York, the disruption to the economy was substantially greater than the destruction of property and cleanup costs would indicate because of drastic cutbacks in tourism, which led to a sharp fall off in hotel stays, dining out in restaurants, and shopping for expensive goods in Manhattan. The lack of spending by consumers led firms in the hotel, restaurant, and retail industries to lay off thousands of workers. According to a study done by the New York City Chamber of Commerce in September 2001, the cost in terms of reduced economic activity was expected to be almost \$40 billion, and the cost in terms of employment was expected to be almost 25,000 jobs. Financial markets were severely disrupted in the short run: they were closed for the remainder of the week, and when they opened the following week, the Dow Jones Industrial Average fell from 9605.5 to 8920.7,



a decline of about 7 percent; at the end of the first week of trading, the Dow had fallen to 8235.8, a decline of about 14 percent. The airline industry was hit hard: in the weeks following September 11, airlines announced plans to lay off tens of thousands of workers—20,000 apiece at American Airlines and United Airlines.

3 The theory of economic fluctuations states that when faced with an economic shock that reduces spending, policymakers can respond by putting into place specific measures designed not only to stop the fall in spending, but indeed to try to restore both confidence and spending by consumers and firms. The president promised \$20 billion in federal aid to New York to help the city rebuild. As fears that one or more airlines would have to go into bankruptcy mounted, both Congress and the Senate sought to provide relief for the beleaguered airline industry by overwhelmingly approving a bill that provided \$5 billion in federal funds and \$10 billion in loan guarantees. The response of monetary policymakers to the events of September 11 was equally swift: on September 17, the Federal Reserve cut interest rates from 3.5 percent to 3 percent, making it cheaper for firms and individuals to borrow money, and also announced its willingness to take steps to restore normalcy to financial markets. Help was not offered only by the government and the Federal Reserve; millions of people all over the United States contributed hundreds of millions of dollars to charities that helped the victims and their families make payments on their rent, school tuition, and health care, doing their part to keep the negative effects from deepening.

4 The theory of economic growth tells us that the long-term growth of an economy depends on its ability to produce goods and services, which in turn depends on the economy's stocks of labor, capital, and technology. While the destruction of life and property in New York and Washington, D.C., was substantial—"more than we can bear," in the words of Mayor Giuliani—the loss of labor and capital was small relative to the size of the entire U.S. population and the entire U.S. capital stock. In the same Op-Ed piece mentioned earlier, Paul Krugman speculated that the long-term effects would not be substantial: "Nobody has a dollar figure for the damage yet, but I would be surprised if the loss is more than 0.1 percent of U.S. wealth—comparable to the material effects of a major earthquake or hurricane." While such calculations may seem a little too cold blooded at first glance, it is important that



macroeconomists make such assessments so that we can develop a more complete understanding of the impacts of such tragedies, and also so that we can come up with appropriate policy responses to these events.

5 The prediction that the events of September 11 would not have a long-term effect seems to have been vindicated by a reassessment of the situation six months later. In the weeks following September 11, the financial markets seemed to stabilize and then recover: by November 9 the Dow had reached the level it was at on September 10, and it ended the year almost 6 percent higher, at 10,178.7. GDP grew rapidly in the fourth quarter of 2001: it increased at a rate of 1.4 percent, signaling a possible return to the sustained positive growth rates experienced during the long expansion. Finally, the unemployment rate seemed to stabilize and then improve as well—after increasing from 5 percent to 5.8 percent over the last four months of 2001, it came back down to 5.4 percent in the first two months of 2002.



9/11/01 wreckage in New York City

Source: Taylor, J. (2004). *Economics* (4th ed.). Boston: Houghton Mifflin Company, pp. 34–35.

Reading Selection 1

WORLD ROOTS OF AMERICAN EDUCATION

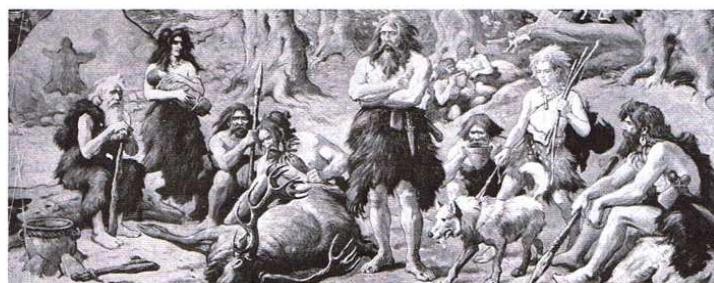
Education in Preliterate Societies

**Muscle
Reading
Reminder**

*Phase Two:
Read
Underline
Answer*

1 Our narrative begins in preliterate times before the invention of reading and writing when our ancestors transmitted their culture orally from one generation to the next. We can find the origins of informal learning in families and appreciate why it remains so powerful even today. Although we live in a time when information is electronically stored and retrieved in computers, an examination of preliterate education can help us understand why schools often tend to resist change as they train the young in essential "survival" skills.

2 Preliterate people faced the almost overwhelming problems of surviving in an environment that pitted them against the drought and floods, wild animals, and attacks from hostile groups. By trial and error, they developed survival skills that over time became cultural patterns. For culture to continue, it had to be transmitted deliberately from the group's adults to its children, a process called acculturation. As children learned the group's language, skills, and values, they inherited and perpetuated their culture.



3 Over time, the group developed survival skills that were inculcated as moral codes in the young. Marking the passage from childhood to adulthood, rituals used dancing, music, and dramatic acting to create a powerful supernatural meaning and evoke a moral response. Thus children learned the group's prescriptions (things they should do) as well as its proscriptions or taboos (behaviors that were forbidden).

Chapter 6: World Roots of American Education

4 Lacking writing to record their past, preliterate societies relied on oral tradition—storytelling—to transmit their cultural heritage. Elders or priests, often gifted storytellers, sang or recited narratives of the group's past. Combining myths and legends, the oral tradition informed the young about the group's heroes, victories, and defeats. The songs and stories helped young people to learn the group's spoken language and develop more abstract thinking about space and time. Today, storytelling remains an entertaining but important way for children to learn about their past and themselves.

5 As toolmakers, humans made and used spears, axes, and other tools, the earliest examples of human-made technology. Similarly, as language users, they created, used, and manipulated symbols. When these symbols came to be expressed in signs, pictographs, and letters, creating a written language, humans made the great cultural leap to literacy and then to schooling.

6 A global frame of reference helps to understand the worldwide movement to develop schools in literate societies. For that reason, our historical survey begins with the ancient empires of China, India, and Egypt.

Education in Ancient Chinese Civilization

7 Because of its long history and vast influence, Chinese civilization offers significant insights into education's evolution. With the world's largest population, modern China is an important global power. Historically it was a great empire whose civilization reached high pinnacles of political, social, and educational development. The empire was ruled by a series of dynasties spanning more than forty centuries from 2200 B.C. to A.D. 1912.* Many educational traditions that originated in imperial China still have an influence today. (See Overview 6.1 for key periods in China and other countries.)



* Shaughnessy, E. (2000). *China: Empire and Civilization*. New York: Oxford University Press.

8 Like many people, the Chinese were ethnocentric and believed their culture and language to be superior to all others.* Scorning foreigners as barbarians, the Chinese were inward-looking, seeing little value in other cultures. Eventually, imperial China's reluctance to adapt technology from other cultures isolated and weakened it and, by the nineteenth century, made it vulnerable to foreign exploitation. The challenge of how to adapt to new ideas, especially in science and technology, and still maintain one's own culture remains an important educational issue in China today and in other countries as well.

9 The Chinese educational heritage reveals persistent efforts to maintain unbroken cultural continuity.[†] These efforts help us understand questions educators still ask: What is the relationship between cultural continuity and change, and how does education promote one or the other?

The Confucian Code

10 In imperial China, Confucian ethics regulated political, social, economic, and educational relationships. A philosopher and government official, **Confucius** (551–478 B.C.) feared violence and political unrest. Therefore, he devised an ethical system that stressed family values and political and social stability. Confucius used two important concepts—hierarchy and subordination—to guide human relationships.[‡] He envisioned the vast Chinese empire as one great extended family, paternalistically governed by the imperial father, the emperor. All the empire's subjects were to be compliantly subordinate and show deep piety toward their ruler.[§] The *Getting to the Source* box presents some Confucian ideas about teaching.

* Prazniak, R. (1996). *Dialogues Across Civilizations: Sketches in World History from the Chinese and European Experiences*. Boulder, CO: Westview.

† Grossman, D. (1896, February). "Teaching About a Changing China." *Social Education*, p. 100.

‡ For primary sources on Confucius, see Confucius. (1979). *The Analects* (D. C. Lau, Trans.). New York: Penguin Books; see also Kai-wing Chow, On-cho No, & Henderson, J. B. Eds.). (1999). *Imagining Boundaries: Changing Confucian Doctrines, Texts, and Hermeneutics*. Albany: State University of New York Press.

§ Fairbanks, J. K., Reischauer, E. O., & Craig, A. M. (1965). *East Asia: The Modern Transformation* (Vol. 2) London: Allen and Unwin, pp. 80–85.



GETTING TO THE SOURCE

A Confucian View of Teaching



Confucius

Confucius (551–479 B.C.) developed the ethical system that governed society, politics, and education in ancient China. Concerned with maintaining social and cultural harmony, Confucius's ideas on education emphasized the proper attitudes and relationships between teachers and students. Confucian philosophy has had and continues to exercise an important influence on culture and education in China, Japan, Korea, and other Asian countries. The following selection is from Confucius's "Record on the Subject of Education."

Record on the Subject of Education

When a superior man knows the causes which make instruction successful, and those which make it no effect, he can become a teacher of others. Thus, in his teaching, he leads and does not drag; he strengthens and does not discourage; he opens the way but does not conduct to the end without the learner's own efforts. Leading and not dragging produces harmony. Strengthening and not discouraging makes attainment easy. Opening the way and not conducting to the end makes the learner thoughtful. He who produces such harmony, easy attainment, and thoughtfulness may be pronounced a skillful teacher.



Among learners there are four defects with which the teacher must make himself acquainted. Some err in the multitude of their studies; some, in their fewness; some in the feeling of ease with which they proceed; and some, in the readiness with which they stop. These four defects arise from the difference of their minds. When a teacher knows the character of his mind, he can save the learner from the defect to which he is liable. Teaching should be directed to develop that in which the pupil excels, and correct the defects to which he is prone.

The good singer makes men able to continue his notes, and so the good teacher makes them able to carry out his ideas. His words are brief, but far-reaching; unpretentious, but deep; with few illustrations, but instructive. In this way he may be said to perpetuate his ideas.

When a man of talents and virtue knows the difficulty on one hand and the facility on the other in the attainment of learning, and knows also the good and bad qualities of his pupils, he can vary his methods of teaching. When he can vary his methods of teaching, he can be a master indeed. When he can be a teacher indeed, he can be the Head of an official department. When he can be such a Head, he can be the Ruler of a state. Hence, it is from the teacher indeed that one learns to be a ruler, and the choice of a teacher demands the greatest care; as it is said in the Record, "The three kings and four dynasties were what they were by their teachers."

Source: Ulich, R. (Ed.). (1954). *Three Thousand Years of Educational Wisdom*. Cambridge, MA: Harvard University Press, pp. 21–22.

Scholarships and Hierarchies

¹¹ At the summit of the Chinese social hierarchy were the emperor and imperial court. Somewhat lower but still very prestigious and powerful were the scholar officials who governed China for the emperor. Next came the wealthy landowners, the gentry, and then the smaller landowning farmers, artisans, and merchants. At the bottom were the landless workers.



12 Like Plato's Republic (discussed later in the chapter), China's educational system was founded on the rationale that only intellectuals were capable of ruling. Since intellectual activity was valued more than applied and manual work, schools aimed to reproduce the intellectual elite by preparing ongoing generations of scholar-officials. Thus they emphasized learning the Confucian classics, especially the *Analects*, a collection of Confucius's lectures on society, government, and ethics. The works of Mencius (371–289 B.C.), a scholar who interpreted Confucius's philosophy, were also important.*

13 Dominating education in imperial China, Confucian ethics tried to develop personal virtue, morality, and loyalty. These values, in turn, would create a harmonious society. Informal education, carried on in kinship groups, emphasized the wisdom of elders, the desirability of maintaining traditional values, and the dangers of departing from custom. These traditional family relationships and values were the foundation of China's civic and social order. Confucianist ethical doctrines were also carried to Japan and Korea, which were influenced by Chinese culture.



Ancient Chinese scholars

* Schirokauer, C. (1991). *A Brief History of Chinese Civilization*. New York: Harcourt Brace Jovanovich, pp. 40–41.



China's Contribution to the World and Western Education

14 An important educational legacy from ancient China was its system of national examinations. Chinese educators developed comprehensive written examinations to assess students' academic competence. Students prepared for the examinations by studying ancient Chinese literature and Confucian texts with master teachers at imperial or temple schools. The examinations emphasized recalling memorized information rather than solving actual problems. The examination process, like the society, operated hierarchically and selectively. Students had to pass a series of rigorous examinations in ascending order; if they failed, they were dismissed from the process.* In imperial days, only a small number of finalists were eligible for the empire's highest civil service positions. The educational and examination systems were reserved exclusively for upper-class males. Ineligible for government positions, women were excluded from schools as well.

15 Currently, national examinations, especially for university entrance, dominate education in modern China and Japan. Other countries such as the United Kingdom have developed national tests. In the United States in 2001, the education act sponsored by the Bush administration required that states, in order to receive federal aid, administer a national test to students in the third through eighth grades. Although national tests contribute to uniform assessment throughout a country, they often force teachers to teach for the test rather than for students' interests and needs.

Muscle Reading Reminder

Phase Three:
Recite
Review
Review Again

POWER GRAMMAR

Language Use Transitions

Take time to analyze pattern changes in subjects, verb tenses, and pronouns as you read. These changes signal transitions in purpose, tone, or expectations for the reading audience. Noticing when the grammar changes as you read can aid your comprehension.

Reading Selection 2

OVERVIEW: KEY PERIODS IN EDUCATIONAL HISTORY,
TO A.D. 1600

Overview Key Periods in Educational History, to A.D. 1600			
Historical group or period	Educational goals	Students	Instructional methods
Preliterate societies 7000 B.C.–5000 B.C.	To teach group survival skills and group cohesiveness	Children in the group	Informal instruction; children imitating adult skills and values
China 3000 B.C.–A.D. 1900	To prepare elite officials to govern the empire according to Confucian principles	Males of gentry class	Memorization and recitation of classic texts
India 3000 B.C.–present	To learn behavior and rituals based on the Vedas	Males of upper castes	Memorizing and interpreting sacred texts
Egypt 3000 B.C.–300 B.C.	To prepare priest scribes to administer the empire	Males of upper classes	Memorizing and copying dictated texts
Greek 1600 B.C.–300 B.C.	<i>Athens</i> : To cultivate civic responsibility and identification with city-state and develop well-rounded persons <i>Sparta</i> : To train soldiers and military leaders	Male children of citizens; ages 7–20	Drill, memorization, recitation in primary schools; lecture, discussion and dialogue in higher schools
Roman 750 B.C.–A.D. 450	To develop civic responsibility for republic and then empire; to develop administrative and military skills	Male children of citizens; ages 7–20	Drill, memorization, recitation in <i>ludus</i> ; declamation in rhetorical schools



Overview Key Periods in Educational History, to A.D. 1600 (cont.)			
Historical group or period	Curriculum	Agents	Influences on Education
Preliterate societies 7000 B.C.–5000 B.C.	Survival skills of hunting, fishing, food gathering; stories, myths, songs, poems, dances	Parents, tribal elders, and priests	Emphasis on informal education to transmit skills and values
China 3000 B.C.–A.D. 1900	Confucian classics	Government officials	Written examinations for civil service and other professions
India 3000 B.C.–present	Vedas and religious texts	Brahmin priest scholars	Cultural transmission and assimilation; spiritual detachment
Egypt 3000 B.C.–300 B.C.	Religious or technical texts	Priests and scribes	Restriction of educational controls and services to priestly elite; use of education to prepare bureaucrats
Greek 1600 B.C.–300 B.C.	<i>Athens</i> : reading, writing, arithmetic, drama, music, physical education, literature, poetry <i>Sparta</i> : drill, military songs and tactics	<i>Athens</i> : private teachers and schools, Sophists, philosophers <i>Sparta</i> : military officers	<i>Athens</i> : the concept of the well-rounded, liberally educated person <i>Sparta</i> : the concept of serving the military state
Roman 750 B.C.–A.D. 450	Reading, writing, mathematics, Laws of Twelve Tables, law, philosophy	Private schools and teachers; schools of rhetoric	Emphasis on education for practical administrative skills; relating education to civic responsibility



Overview Key Periods in Educational History, to A.D. 1600 (cont.)			
Historical group or period	Educational goals	Students	Instructional methods
Arabic A.D. 700–A.D. 1350	To cultivate religious commitment to Islamic beliefs; to develop expertise in mathematics, medicine, and science	Male children of upper classes; ages 7–20	Drill, memorization, recitation in lower schools; imitation and discussion in higher schools
Medieval A.D. 500–A.D. 1400	To develop religious commitment, knowledge, and ritual; to prepare persons for appropriate roles in hierarchical society	Male children of upper classes or those entering religious life; girls and women entering religious communities; ages 7–20	Drill, memorization, recitation, chanting in lower schools; textual analysis and disputation in universities and higher schools
Renaissance A.D. 1350–A.D. 1500	To cultivate a humanist expert in classics (Greek and Latin); to prepare courtiers for service to dynastic leaders	Male children of aristocracy and upper classes; ages 7–20	Memorization, translation, and analysis of Greek and Roman classics
Reformation A.D. 1500–A.D. 1600	To instill a commitment to a particular religious denomination; to cultivate general literacy	Boys and girls, ages 7–12, in vernacular schools; young men, ages 7–12, of upper class backgrounds in humanist schools	Memorization, drill, indoctrination, catechetical instruction in vernacular schools; translation and analysis of classical literature in humanist schools



Overview <i>Key Periods in Educational History, to A.D. 1600</i> (cont.)			
Historical group or period	Curriculum	Agents	Influences on Education
Arabic A.D. 700–A.D. 1350	Reading, writing, mathematics, religious literature, scientific studies	Mosques; court schools	Arabic numerals and computation; reentry of classical materials on science and medicine
Medieval A.D. 500–A.D. 1400	Reading, writing, arithmetic, liberal arts; philosophy, theology; crafts; military tactics and chivalry	Parish, chantry, and cathedral schools; universities; apprenticeship; knighthood	Establishment of the structure, content, and organization of universities as major institutions of higher education; the institutionalization and preservation of knowledge
Renaissance A.D. 1350–A.D. 1500	Latin, Greek, classical literature, poetry, art	Classical humanist educators and schools such as lycée, gymnasium, Latin school	An emphasis on literary knowledge, excellence, and style as expressed in classical literature: a two-track system of schools
Reformation A.D. 1500–A.D. 1600	Reading, writing, arithmetic, catechism, religious concepts and ritual; Latin and Greek; theology	Vernacular elementary schools for the masses; classical schools for the upper classes	A commitment to universal education to provide literacy to the masses; the origins of school systems with supervision to ensure doctrinal conformity; the dual-track school system based on socioeconomic class and career goals



Source: Ornstein, A.C., & Levine, D.U. (2003). *Foundations of Education* (8th ed.). Boston: Houghton Mifflin, pp. 60–61.

Reading Selection 3

Education in Ancient Indian Civilization

16 Like China, India is an ancient civilization. River valley civilizations flourished on the banks of India's Indus River at Mohenjo-daro and Harrapa from 3000 B.C. to 1500 B.C. These civilizations developed an elaborate urban culture with well-plotted brick houses, copper tools, and drainage and sanitation systems.

17 India's educational history reveals a general pattern of intrusion by invaders, followed by a cultural clash with the indigenous people, and then the restoration of sociocultural equilibrium. In this cultural equilibrium, the invaders were absorbed in India's culture while at the same time indigenous people borrowed some of the invader's ideas.*

18 Among the early invaders were the Ayrans, ancestors of India's Hindi-speaking majority who conquered India in 1500 B.C. and imposed their rule over the indigenous Dravidian inhabitants. They were followed by the Muslims, who established the Mughul dynasty in the thirteenth century. Then, in the eighteenth century, the British gained control over India.

19 Cultural changes introduced by India's earliest invaders, the Ayrans, had powerful social and educational influences that continue even today. The Ayrans introduced their religion, Hinduism, and their highly stratified social order, the **caste system**.

20 Hinduism, a powerful central force in India, incorporates a wide range of religious beliefs and elaborate rituals. Believing in the transmigration of souls, Hinduism emphasizes that a person's soul experiences a series of reincarnations. A person's position in the cosmic scale depends on how well he or she performs duties and rituals. Reincarnation ends only when a soul reaches the highest spiritual level and is reabsorbed in Brahma, the divine power.[†]

21 The four original castes were **Brahmins**, priest-educators; **Kshatriyas**, rulers, judges, and warriors; **Vaishyas**, merchants; and **Shudras**, the farmers. At the bottom of the caste system were the

* For India's history and culture, see Vohra, R. (1997). *The Making of India: A Historical Survey*. Armonk, NY: M. E. Sharpe; and Kulke, H., & Rothermund, D. (1998). *A History of India*. New York: Routledge.

† Mulhern, J. (1959). *A History of Education: A Social Interpretation*. New York: Ronald Press, pp. 80–128; and Nakosteen, M. (1965). *The History and Philosophy of Education*. New York: Ronald Press, pp. 23–40.



untouchables, who performed the most menial work. There was no social mobility. People stayed in the caste into which they were born. Based on their caste, people learned their duties and roles by imitating parents and other adults. Schooling was reserved for the upper castes, primarily the Brahmins. Outlawing caste-based discrimination, modern India has an "affirmative action" for lower caste members. However, like racism in the United States, discrimination still exists.

Evolution and Indian Education

22 The development of education in India is closely linked to general historical pattern of assimilating different cultures. The earlier schools reflect the cultural changes brought by the Aryans. Ancient India had the following types of schools:

- Brahmanic schools, for the priestly caste, stressed religion, philosophy, and the *Vedas*. The *Vedas*, the *Bhagavad Gita*, and the *Upanishads*, Hinduism's sacred religious books, portray the goal of life as a search for universal spiritual truths. The quest for truth, Indian educators believe, requires disciplined meditation. Contemporary transcendental meditation and yoga follow these ancient Indian principles for finding inner spiritual truth and serenity.
- *Tols* were one-room schools where a single teacher taught religion and law.
- Court schools, sponsored by princes, taught literature, law, and administration.

23 Hindu educational philosophy, emphasizing religious purposes, prescribed appropriate student-teacher relationships. The teacher, an *ayoha*, was to encourage students to respect all life and to search for truth. Students were to respect teachers as a source of wisdom, and teachers were to refrain from humiliating students.*

24 The Mughul dynasty, established after the Muslim invasions, introduced the Islamic religion and Persian and Arabic philosophy, science, literature, astronomy, mathematics, medicine, art, music, and architecture.

* Patel, N. (1994). "A Comparative Exposition of Western and Vedic Theories of the Institution of Education," *International Journal of Educational Management*, 8, pp. 9-14.



25 By the time the English entered India in the late eighteenth century, India's schools were conducted either by Hindus or Muslims or by smaller sects such as Buddhists, Jains, and Parsis. Only about 10% of India's children, mostly boys, attended. Hindu higher schools, conducted by Brahmins, emphasized religious literature, mathematics, astronomy, and Sanskrit grammar. Muslim schools, called *madrassahs*, were attached to mosques and emphasized grammar and the Koran.*

26 When the English established their colonial rule in India, they encountered an ancient civilization with many languages and religions. Placing a greater value on their own language than on those spoken in India, the English imposed their own language as the official one for government and commerce. Therefore, they established English-language schools to train Indians for positions in the British-controlled civil service.

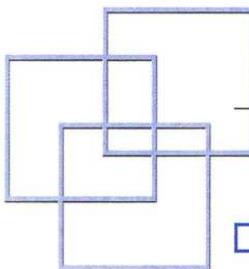
India's Contribution to the World and Western Education

27 Ancient India's legacy to the world demonstrates how education helped a civilization to endure over centuries. Through the processes of cultural assimilation and readaptation, Indian civilization has survived to the present. In today's climate of rising ethnic and religious tensions, India still faces profound challenges in assimilating and respecting diverse cultures. The United States and other culturally pluralistic nations face similar challenges. Finally, the Indian situation reveals how caste, like racism in the United States, was once perpetuated by society and indoctrination but is now being corrected through educational process.

Source: Ornstein, A. C., & Levine, D. U. (2003). *Foundations of Education* (8th ed.). Boston: Houghton Mifflin, pp. 64-65.

* Edwards, M. (1967). *Raj: The Story of British India*. London: Pan Books, p. 133.





Reading Assignment 4

EDUCATION IN ANCIENT EGYPTIAN CIVILIZATION

Reading for a Purpose

This is the last reading passage. Read actively. Think about all the different reading strategies you have learned and used this semester. Put them into practice!



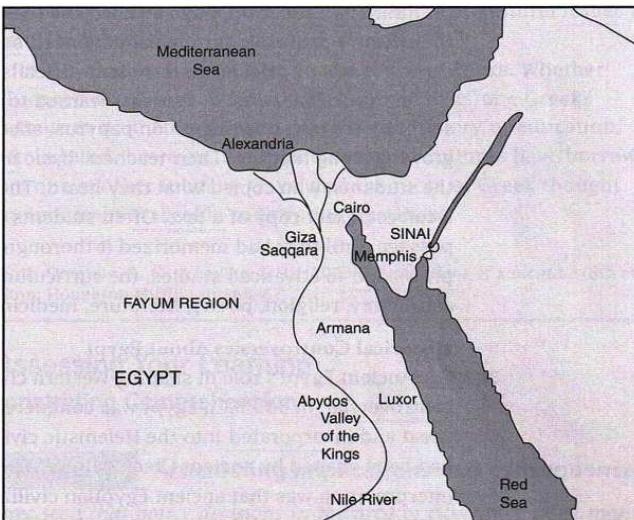
Education in ancient Egypt

Reading Selection 4

Education in Ancient Egyptian Civilization

- 28 Like other early civilizations, ancient Egypt—one of the world's earliest—developed as a river valley culture. Because of the Nile River's life-sustaining water, agricultural groups established small village settlements on the Nile's banks that were first organized into tribal kingdoms. About 3000 B.C. these kingdoms consolidated into a large empire, which eventually became a highly organized and centralized political colossus.
- 29 An important Egyptian religious and political principle affirmed that the pharaoh, the emperor, was of divine origin. The concept of divine emperorship gave social, cultural, political, and educational stability to the Egyptian empire by endowing it with supernaturally sanctioned foundations. Knowledge and values were seen as reflecting an orderly, unchanging, and eternal cosmos. The concept of king-priest also gave the priestly elite high status and considerable power in Egyptian society. The educational system reinforced this status and power by making the priestly elite guardians of the state culture.





Egyptian empire circa 2700 BC

Religious and Secular Concerns

30 Educationally, the Egyptians were both otherworldly and this-worldly. Although preoccupied with the supernatural, they were also concerned with the technologies needed to navigate the Nile Valley and to design and build massive pyramids and temples. To administer and defend their vast empire, they studied statecraft, and their concern with mummification led them to study medicine, anatomy, and embalming. The Egyptians also developed a system of writing, hieroglyphic script, that enabled them to create and preserve religious, political, and medical literatures.

31 The Egyptian empire required an educated bureaucracy to collect and record taxes. By 2700 B.C., the Egyptians had in place an extensive system of temple and court schools. One of the school system's basic functions was to train scribes, many of whom were priests, in skills of reading and writing. Schools were often built as part of the temple complex, and there was a close relationship between formal education and religion.* After receiving some

* Mulhern, J. (1959). *A History of Education: A Social Interpretation*. New York: Ronald Press, pp. 55–79.

preliminary education, boys studied the literature appropriate to their future professions. Special advanced schools existed for certain kinds of priests, government officials, and physicians.

32 In the scribal schools, students learned to write the hieroglyphic script by copying documents on papyrus, sheets made from reeds growing along the Nile. Their teachers' basic method was dictating to the students, who copied what they heard. The goal was to reproduce a correct, exact copy of a text. Often students would chant a short passage until they had memorized it thoroughly. For those who proceeded to advanced studies, the curriculum included mathematics, astronomy, religion, poetry, literature, medicine, and architecture.

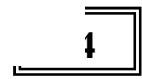
Historical Controversies About Egypt

33 Ancient Egypt's role in shaping Western civilization has become controversial. In 332 B.C., Egypt was conquered by Alexander the Great and incorporated into the Hellenistic civilization, which in turn had been shaped by ancient Greek culture. The conventional historical interpretation was that ancient Egyptian civilization was a highly static despotism and that its major cultural legacy was its great architectural monuments. This interpretation saw Greek culture, especially Athenian democracy, as the cradle of Western civilization.

34 A highly controversial interpretation by Martin Bernal argues that the Greeks borrowed many of their concepts about government, philosophy, the arts, and sciences from Egypt. Furthermore, the Egyptians, geographically located in North Africa, were African people, and the origins of Western culture are therefore African.* Though they recognize that there were interactions between the Egyptians and the Greeks, Bernal's critics contend that he greatly overemphasizes Egypt's influence on ancient Greece. While historians continue to debate the matter, tentative findings indicate that Egyptian-Greek contacts, particularly at Crete, introduced the Greeks to Egyptian knowledge, such as mathematics, and to Egyptian art forms.

35 This intriguing historical controversy has important ideological significance. Whoever interprets the past gains the power of illuminating and shaping the present. In particular, the controversy relates to current debate about Afrocentrism and Afrocentric

* Bernal, M. (1987). *Black Athena: The Afroasiatic Roots of Classical Civilization: The Fabrication of Ancient Greece 1785–1985*. New Brunswick, NJ: Rutgers University Press, pp. 2–3.



curriculum. It also shows how contemporary multicultural issues are stimulating new historical interpretations.

In the next section we turn to the ancient Greeks. Whether influenced directly or indirectly by the Egyptians, the Greeks continue to hold an important place in the history of education. Keep in mind, however, that most historical cultures have borrowed from one another in many ways, and the roots of Greek thought may indeed be traceable to Egypt or elsewhere.

Source: Ornstein, A. C., & Levine, D. U. (2003). *Foundations of Education* (8th ed.). Boston: Houghton Mifflin, pp. 66-67.

